

AMERICA'S MERCHANT MARINE

*A Presentation of Its History
and Development to Date
with Chapters on Related
Subjects*

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Foreword

REALIZING the deep interest, both national and international, in the American Merchant Marine, we have prepared this volume for distribution to our customers and friends. It is, as will be seen, an original work, and gives a compact history of our merchant marine, with chapters on related subjects. The greatest possible care has been taken to insure the strictest accuracy of this volume. Every statement has been derived from official reports or from other trustworthy sources. As an additional precaution against possible errors, the proof sheets were submitted to a number of leading maritime men who were requested to give them a critical reading. The judgment of some of these authorities may, with propriety, be here quoted.

"I have no hesitancy in pronouncing your treatise on this subject as the best and most comprehensive handling of the subject I have yet seen," is an extract from a letter of Captain C. A. McAllister, vice-president of the American Bureau of Shipping and Secretary of the U. S. Shipping Board Navigation Laws Revision Committee. Winthrop L. Marvin, the noted authority on American merchant marine matters, writes: "I have examined the text of 'America's Merchant Marine' which you are publishing, and regard it as an exact, comprehensive and particularly timely work. Its historical review is excellent, and its survey of maritime conditions during and since the great war brings together symmetrically the facts and figures requisite to full present information." George S. Dearborn, president of the American-Hawaiian Steamship Company, who has a long and intimate knowledge of the career of our merchant marine, says of this work: "It

treats of the development of the merchant marine in a very comprehensive manner, and its chronological presentation of each era is very well covered; it is, in fact, one of the best on the subject I have read in recent years." P. De Ronde, president of the Oriental Navigation Company, comments: "In such works as this there frequently occur glaring inaccuracies in figures and statements, none of which I have been able to find in this." R. A. C. Smith, former Dock Commissioner of New York, says: "I hope that your interesting and valuable pamphlet will be widely read and that it will aid in forming an intelligent public opinion in support of a sound policy for our American Merchant Marine." The opinion of H. Farquharson Kerr, president of the Kerr Steamship Company, is thus expressed: "'America's Merchant Marine' seems to me to cover the subject with great and accurate thoroughness, and will, I think, rank as a work of the first importance with a wide and enduring influence." Alfred Gilbert Smith, president of the New York and Cuba Mail Steamship Company, says: "The book is, on the whole, the best of its kind that I have ever seen." H. H. Raymond, president of the Clyde Steamship Company, declares this work to be "an excellent presentation." A. R. Nicol, president of the Atlantic, Gulf and West Indies Steamship Lines, says: "So far as I know, it is the most comprehensive and up-to-date publication of the kind which has yet been issued, and I think it will be regarded as a standard work."

We hope that "America's Merchant Marine" may prove particularly useful to shipping men, exporters and importers as an authentic and timely reference book.

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America's Merchant Marine

CHAPTER I

Its Inception

SHIPBUILDING was begun in the colonies early in the seventeenth century. In 1607 the Popham Colony launched a 300 ton ship on the Kennebec. A decked vessel was built in 1614 at New Amsterdam—later New York City. *The Blessing of the Bay*, a bark of 30 tons, owned by Governor Winthrop, was launched in 1631 at Medford, Massachusetts. When, in 1641, Richard Hollingsworth launched a 300 ton ship at Salem it was regarded as a large vessel. It was for that period; the *Mayflower* which brought over the Pilgrims in 1620, was only 180 tons. At Gloucester, which had been a fishing station since 1623, a ship was built in 1643.

The virtual founder of American shipbuilding as a distinct, continued industry was that remarkable character William Phips. An illiterate shepherd youth he went from his native place near Bath, Maine, to Boston, where he learned how to read and write. Later he became a trader, and marriage brought him wealth. With one of his own ships he succeeded, in 1687, in recovering \$1,500,000 in bars of gold and jewels from a Spanish treasure ship which had been sunk near the Bahamas. For this service he was knighted by the British king, and was awarded \$80,000 as his share of the find.

Lord Bellomont, who a little later was Captain-General of New York, Massachusetts Bay and other colonies, enthusiastically reported to the Lords of Trade, at London, that there was timber enough in New York to supply the entire British navy for an indefinite period. The British policy then and for many decades was to discourage shipbuilding and other industries in the colonies. By 1715 many hundreds of ships had been built in the colonies. In 1724 a group of Master Builders of London petitioned the Lords of the Committee on Plantations "not to encourage shipbuilding because workmen were drawn thither."

The Schooner Created

Despite restrictive orders and laws, shipbuilding increased in the colonies. In 1728 a sloop was built at Portland, Maine, and in 1737 a masted ship was constructed in the same harbor. Maine, then a part of Massachusetts, became a considerable producer of ships. Captain William Swanton, in 1762, established at Bath one of the first permanent shipyards in the colonies. It was from his yards that such full-rigged ships as the *Earl of Bute*, the *Rising Sun* and other craft came, and a number of privateers during the Revolution. He died in 1810 at the age of 99 years. One of his contemporaries was Joshua Raynes who, in 1762, built a sloop at Bath. Later his yards turned out a schooner of about 100 tons, costing \$3,000. "This," wrote a local historian, "was a great undertaking for that period, and many people attended the launching of the vessel." The schooner type of craft had been first built at Gloucester in about the year 1713. According to tradition, a boy excited at the speed she made on her trial trip exclaimed "See how she schoons!" "A schooner let her be!" agreed the builder hearing the remark. The word schoon in

New England meant making a flat stone skip along the water. Novelties at first, schooners gradually succeeded sloops, and were in turn supplanted by brigantines and full-rigged ships, and these subsequently by ships. The colonial trade was largely lumber, fish and furs sent to Europe and other parts of the world, and bringing back manufactured articles and various commodities. The smaller class of vessels was used in the West India trade taking out lumber and fish and returning with rum, molasses and sugar. Whaling was also extensively carried on. But all colonial trade was regulated entirely by British law and limited to England's ships.

Notwithstanding the successive navigation laws decreed by England, on the one hand, and the depredations of pirates, on the other, the colonies' shipping kept on increasing. In the single year 1769 twelve colonies built a total of 389 ships, 20,000 tonnage in all. By the time of the Revolution one third of the vessels flying the British flag were American built, and Massachusetts was reported to have owned one seagoing vessel for every 100 inhabitants. Many of these vessels were armed as privateers and made great inroads upon the British merchant fleet during the Revolution. To exclude American competition, a British order-in-council, decreed after the Revolution, prohibited the purchase of American-built ships. It was then a customary practice on the part of foreign shipbuilders to disparage the qualities of American-built ships. But as a matter of fact, they were in general staunchly built and many had long sailing careers. The *Massachusetts*, built at Quincy in 1789, was for many years one of the largest ships afloat. The *Maria*, built at Pembroke, Massachusetts, in 1782, had a sailing life of 90 years. The *Peru* built in Massachusetts, in 1818, sailed the ocean for 66 years.

After the Revolution

Immediately following the peace of 1783 shipbuilding and shipping on the Atlantic coast were in a prostrated condition. This fact was one of the pressing causes leading to the Constitutional Convention. Previously each State had its own laws and regulations. The result to the merchant marine was confusion, discouragement and injury. With the establishment of the United States Government, five of the first eleven acts of Congress were laws to encourage and regulate American shipbuilding and shipping. Acts passed in 1789 confined national rights of trade to ships built in the United States or owned by American citizens or taken as prizes by forfeiture. Congress provided for a reduction of 10 per cent. in the duties laid upon imports when carried by American ships. A tonnage bill laid a tax of 6 cents on American built ships if owned by Americans, 30 cents if owned by foreigners, and 50 cents if foreign built and foreign owned. The legislation provided that foreign ships engaged in the coasting trade were required to pay the tonnage tax every time they entered port, while American vessels had to pay it only once a year. In 1794 Congress increased duties on foreign merchandise, and in place of the reduction of 10 per cent. in duties upon goods when carried by American vessels, it substituted a tariff addition of 10 per cent. upon goods imported in foreign vessels.

By an act passed in 1804 a light-money tax of 50 cents per ton was placed on foreign vessels, and in 1812 the rate was increased to \$1.50 a ton. From 1789 to 1830 Congress passed more than 50 tariff or other laws the purpose of which in one way or another was to benefit American shipping.

For the development of the Asiatic trade heavy specific duties were laid by the legislation of 1789 upon tea and other

Oriental products if conveyed in any other than American vessels. In addition, the United States Government gave singular privileges to shippers engaged in the East India and China trade. It extended credit for nine, twelve and eighteen months before it demanded payment of tariff duties. As the shippers and shipowners were then usually the same individuals or firms, this practice actually allowed them the free use of Government funds as capital for further shipbuilding and operating enterprises. This partiality to the East India and China trade long prevailed. The Mercantile Society of New York in 1821 protested to Congress (House Committee on Manufactures) against what it termed favoritism to the East India and China shippers. The tariff provisions partial to the Asiatic trade were reenacted in various laws up to 1830.

The Spirit of Enterprise

Many of the shippers in the East India and China trade were then concentrated in Massachusetts. Their profits were not merely large but great. On a single round trip to China the *Mount Vernon* of Salem, in 1799, made a profit of \$100,000, four times her original cost. The schooner *Rajah* of Salem, on a cargo of pepper from Sumatra, yielded 700 per cent. on the investment. Cargoes of coffee sometimes brought a profit of 300 and 400 per cent. The prospect of exceptional profits stimulated shipping merchants to the most remarkable adventures, and the spirit of enterprise animated seamen. In his biography of his father-in-law, Peter Charndon Brooks, a leading shipping merchant of the period, Edward Everett tells of a ship sailing from Calcutta to Boston with a youth of 19 years in command. This juvenile captain had nothing in the way of a chart on board except a small map of the world

in Guthrie's Geography. He made the trip successfully; later he became a Boston banker. On the first trip of the Salem frigate *George*, owned by George Peabody, to India, in 1815, hardly a man of her crew was 21 years old, yet each was qualified as an experienced seaman, and nearly every one was a navigator. Of the sailors who served on the *George* during her long career 45 became captains, 20 chief mates, and six second mates. Many of the shipping merchants of the time became owners of large fleets of vessels.

William Gray of Salem owned at one time more than 60 sail of square-rigged vessels. The ships of Thomas Handasyd Perkins made 30 voyages around the world, and brought him a fortune of \$2,000,000 from the Canton and Calcutta trade. Joseph Peabody built in Salem and owned 83 ships which he sent to all parts of the world; he had 7,000 seamen in his employ. Stephen Girard was the leading Philadelphia shipper with numerous vessels plying over the globe, and in New York there were a number of shippers doing an extensive trade.

CHAPTER II

Supremacy and Decay

THE REGISTERED American tonnage in the foreign trade grew from 123,893 tons in 1789 to 346,254 in 1790. By 1794 it was 438,863 tons. The percentage of imports carried in American ships increased from 17.5 per cent. in 1789 to 91 per cent. in 1794. By 1800 the registered American tonnage in the foreign trade reached 667,107 of a total American merchant marine of 972,492 tons.

One of the main reasons for this increase was the effect of the wars growing out of the French Revolution. "The commerce of the United States has been carried beyond our most sanguine expectations," said a Memorial of Newburyport shipping merchants to Congress in 1803. "Aided by our neutral character, we have been during the late war the principal carriers of Europe; and the rapid increase of our navigation has kept pace with this extraordinary demand, and enabled us to vie with the most wealthy nations on the globe."

There was an attempt made in 1803 to repeal the discriminatory laws between American and foreign duties on imports and tonnage. The New York Chamber of Commerce in its memorial of protest in 1803 to Congress, contended that if it succeeded, American shipbuilders and operators could not compete with Europe. That memorial gives a different picture from statements in most histories of shipping that because of the abundance of timber in the United States vessels then could be built cheaper here than abroad. "Foreigners," urged the New York Chamber of Commerce,

"build vessels much cheaper than we can. A vessel built of European oak costs, when equipped for sea, at the rate of \$36¼ per ton; and if built in Finland of fir, at the rate of \$19 a ton. While the American vessel, built of our common oak and not so well equipped costs from \$40 to \$45 a ton; but if built of live oak and cedar from \$50 to \$55 a ton." The memorial further said that materials for equipment (iron, hemp, sail cloth, etc.,) were all cheaper abroad, and the price of labor for working them was supposed to be 50 per cent. less than in the United States. The memorial went on to point out that: "Foreigners navigate cheaper, seamen's wages are lower, and many of their crews consist of apprentices, without wages. The apprentice act of Great Britain compels every owner or master to take with him a certain number of apprentices; and this they find so advantageous that they frequently double or treble that number, more especially from the North of England. Hollanders, Hamburgers, Danes, Swedes, etc., man their vessels with a still greater proportion of apprentices, and in the cheapness of their living, clothing, etc., they have a very material advantage over the United States. Thus it appears that foreigners can build cheaper, equip cheaper and sail their vessels cheaper than we can; and it may be added, that Europeans are generally satisfied with a less gain than the American merchant can afford to receive."

Superior American Methods

But at the time this difference had no effect upon the American merchant marine which continued to increase. The Embargo Act of 1807 temporarily reduced it but by the year 1810 it reached 981,019 registered tonnage in foreign trade, and a total of 1,424,783 tons. There were a number of

reasons for this steady growth. One reason was the protection extended by discriminatory laws and customs privileges. Another reason was the fact that Europe was in a series of wars and outgrowing retaliations, and was in no position to do any effective competing. These wars shifted more and more of the carrying trade to America. A third reason was the extraordinary enterprise, often daring, of American shippers. Their progressive methods stood out in great contrast with those of European conservatism.

In encouraging in every practical way the upbuilding of the merchant marine, the policy of the United States Government was directed not only at extending commerce but to provide a school for seamen that the nation realized would greatly constitute its strength and security in time of war. The vast bulk of the seamen were Americans. A report of the Secretary of State to the United States Senate early in 1813 stated that of a total of 106,757 American seamen registered in the custom houses of the United States from 1796 to 1812, only 1,530 were given as naturalized citizens. The report, however, went on to say the number of seamen actually enregistered during that period exceeded the number reported by more than one-third.

In the Napoleonic wars the American merchant marine, from 1810 to 1812, suffered a loss of about five per cent. in vessels caused by the antagonistic methods of the contending powers. England's policy of impressment of America's sailors took many thousands of seamen from American vessels. Then came the war of 1812 which caused severe losses to American merchant vessels. But, on the other hand, American privateers captured millions of dollars worth of British ships. By the year 1815 American registered tonnage in foreign trade was placed at 824,295 and the total tonnage at 1,368,128.

These, however, were merely nominal figures. In reality, more than 200,000 tons of registered shipping had been lost by capture or lost at sea or had been destroyed or transferred to coastwise traffic and had not been taken from the custom house lists.

There now came a departure from the early policy of tariff protection to American shipping. The political trend of the times in the United States was toward modifying the tariff policy and in the direction of removing commercial barriers leading to international misunderstandings. In 1815 Congress passed a Reciprocity Act, which offer Great Britain, Sweden and Algiers accepted. But in operation the stipulations practically allowed Great Britain to continue her law of 1783 closing her West Indian ports to American shipping. Moreover, by the repeal of discriminatory duties on the part of the United States, British ships were able to take cargoes to the United States, reload with cargoes for the West Indies, again reload and sail for home or other ports, thus making triple profits.

Reprisals and Reciprocity

Congress retaliated by forbidding admission to British ships coming from any British port from which American vessels were excluded. In 1817 Congress prohibited the importation of goods from any foreign port except in American vessels or ships of the country from which the cargoes came. Vessels of countries not excluding American vessels were excepted. But these reprisals were of short duration. In 1828 Congress renewed offers of reciprocity. A number of reasons actuated it. In the first place, the idealism so characteristic of the American people was manifesting itself not merely for

political but for closer commercial brotherhood. Second, American industries were fast developing, and occupied a correspondingly larger attention than in the years when foreign trade was thought more important. Third, as the interior of the country was more opened up, representatives from the seaboard had relatively less influence. Fourth, America's merchant marine was so successful—in 1826 it carried 92.5 per cent. of the United States imports and exports—that many legislators now believed it could continue to hold its own. Congress passed an act opening American ports to cargo-carrying British vessels from any country where American vessels were on the same footing as British vessels. This act was followed by the British West Indies being opened, in 1830, to American vessels. It also led to the negotiation of more than 30 reciprocity treaties and conventions with various nations. But although formally accepting the principle, many foreign governments circumvented the purpose by shipbuilding and navigation subventions and subsidies and by other devices. From this time dated the diminishing importance of the American merchant marine in the foreign carrying trade. Hardly noticeable at first, the seriousness of the decline became more evident in later years. Some writers have attributed it wholly to the legislation of 1828. But it is probable that the long European peace following the Napoleonic wars had its large effect in allowing European nations to give their attention to competition.

Perhaps this loss to the American merchant marine was retarded by two new factors giving a fresh impetus to American ship building and to the shipping trade. One factor was the opening in 1824 of the Erie Canal, about 340 miles long, connecting the Atlantic by way of the Hudson River with Lake Erie. The Erie Canal gave, in particular, the preemi-

nence to New York City as a shipping port and immediately increased its commerce \$60,000,000 a year—an impressive sum at that period. But the general stimulating effects of the Erie Canal were felt in other ports, also, and these results were increased by the later building of other canals.

The other factor was the cession of Florida by Spain to the United States in 1819. The timber supply within a convenient radius of northern shipyards had begun to give out. In Maine this happened about the year 1818. There was an abundant supply of timber in the interior but there were no railroads to transport it. In Florida and Georgia there were great quantities of live oak timber, and it was an easy and cheap process to haul it from there by water. Gangs were sent South to cut this timber. The first use of it, in 1818, 1819 and 1820, was for naval vessels. About the year 1838 merchant vessels in Northern shipyards were first built of Southern live oak. The building of a ship then took from a year to 13 months; all the materials had to be prepared by hand with the broad axe, the adz and the pod augur. The shipwrights and blacksmiths were highly expert.

It was recognized that steam as a propelling power was bound to bring a great revolution in shipbuilding and navigation. The first steam vessel to cross the Atlantic was the *Savannah* in 1819, but she was really a sailing ship, carrying steam machinery simply as an auxiliary.

The Clipper Speeders

It was, in fact, largely as a last means of warding off the incoming steamship competition that the clipper was created. The prime quality of the clipper type was speed; in cargo carrying she was not as fully serviceable as other classes of ships. The progenitor of the clipper was built at Baltimore

in 1832. The first real clipper—the *Rainbow*—was designed in 1843 at New York. In the same year the *Antelope* was built at East Boston. The *Gamecock*, built at the same place, made a remarkable run from Honolulu to Hong Kong in 19 days. The *Dreadnaught*, otherwise called *The Flying Dutchman*, built at Newburyport, was one of the largest and fleetest clippers, making on one occasion, it was reported, the run from Sandy Hook to Queenstown in 13 days, nine hours. From the yards at Bath, Maine, and Portsmouth, N. H., came a number of famous clippers. The *Great Republic*, built at East Boston in 1853 was considered such a wonder that 30,000 people crowded to see her launching. The *Titan*, built at New York in 1855 was another noted clipper. Following the discovery of gold in California and the rush of passengers and freight, there was a keen demand for clippers, the fast service of which was valued. The price of cargoes in California was then in a measure determined by the speed with which they were delivered. A single voyage would often bring more earnings than the ship originally cost. Some of the clippers were in the European and Asiatic trade.

When in 1849 England adopted the Free Trade policy, full reciprocity was established between British and American shipping. With the repeal of England's navigation laws, British merchants began to buy or charter the speedy American clippers. These could make five voyages while a British ship was making four of equal distances. In 1850 the total tonnage of merchant shipping, including steam vessels, in the United States was 3,535,454 tons. American ships carried 72.5 per cent. of United States imports and exports. In the same year Great Britain had a merchant marine totalling, in the home and foreign trade, 3,565,133 net tons of which 168,474 net tons were steam vessels. The shipping of the entire British Empire totalled 4,232,962 net tons.

The climax of American shipbuilding for that era was attained in 1855. The three leading shipbuilding States were then Massachusetts, Maine and New York. In that year American yards turned out 2,027 vessels of a total of 583,540 gross tons, including 381 ships, barks and barkentines, 126 brigs, 605 schooners, 669 sloops, canal boats and barges, and 246 steam vessels. Nearly one-half of this tonnage was built on the New England coast. The total American merchant marine in 1855 was 5,212,001 tons, of which a little more than half were registered vessels in foreign trade. Of America's entire merchant tonnage 4,441,716 tons were sailing vessels. By 1861 the United States reached its highest point in ship tonnage engaged in foreign trade. It ranked second among the nations of the world, having a foreign trade carrying tonnage of 2,496,894 tons. Great Britain then had 3,179,683 tons in the foreign trade.

British Iron Steamships Conquer

Notwithstanding the growth of American-built tonnage, there had been a slow yet steady decline in the percentage of American exports and imports carried in American vessels. But now a combination of causes set in which greatly hastened the decline of America's shipbuilding industry itself. American enterprise in shipbuilding forced England to improve its designs, and in 1855 the British began to experiment successfully with large iron steamships. England's iron industry was then far in advance of that of the United States. With great accessible deposits of coal and with cheap labor England could produce and operate iron ships at a minimum of cost, while in America the timber for wooden ships had to be brought from increasingly greater distances to the yard.

The foreign demand for American wooden sailing vessels was checked. Unable to compete with Britain's iron ship industry, American capital ceased to invest in wooden ships. The tonnage built in American shipyards fell precipitately—from 583,450 in 1855 to 156,602 in 1859 and 214,797 in 1860. At the same time there came our Civil War. This by engrossing general attention and upsetting conditions diverted American energy and enterprise from commercial shipping problems, and allowed competitors to absorb the foreign carrying trade. In the Civil War not only were many American ships destroyed, but a large amount of tonnage was driven under the protection of foreign flags.

Along with these causes there was another influence. The period immediately before and following the Civil War was one of intensive internal improvements and enterprises. Vast lines of railroads were built, mines and manufactures developed. These took all the available American capital which, in turn, found them a more profitable investment than building and owning ships for the foreign carrying trade.

Obsolete Wooden Shipyards

Numbers of New England ship yards became extinct while others were barely active in producing wooden ships. A number of iron steamships were made in American yards, and this industry continued to some degree. In 1872-1873 the Cramp shipyard built four iron steamers for transatlantic service for the American Steamship Company of Philadelphia. These later were disposed of to the International Navigation Company. Some iron steamships were built at John Roach's yard at Chester on the Delaware, a few others at Wilmington, Del., and some at smaller yards elsewhere.

The result of these conditions was soon evident. In 1858

American vessels carried 73.7 per cent. of United States imports and exports. In 1861 they carried 65.2 per cent. of these. By 1872 only 29.2 per cent. of American imports and exports was carried in American vessels. By 1881 the percentage fell to 16.5 and with but an occasional halt continued falling year after year.

CHAPTER III

Demands for Its Revival

IT WAS not until 1879 that Congress could be induced to interest itself seriously in the subject of the revival of America's merchant marine. Session after session had been occupied with reconstruction measures necessitated by the Civil War or with projects designed to aid and promote railroad development. In this concern for railroad extensions, Congress correctly represented the attitude of the great mass of the American people, particularly in the West and Far West. The attention of the American public, on the whole, was concentrated upon internal transportation.

On June 14, 1879, the House of Representatives adopted a resolution calling upon the Committee on Commerce to investigate the matter of shipping, and consider what measures should be taken for the restoration of America's merchant marine. Reporting on February 26, 1881, this committee reviewed the causes leading to the decadence of our merchant marine, and commented: "To these causes combined, which we have enumerated, may be attributed the loss of the ocean-carrying trade rather than the lack of enterprise among our people, or the want of new or the repeal of old navigation laws. We have been engaged, too, in facilitating our internal commerce, subsidizing and building railroads to transport our products from the Far West to the interior and the seaboard." The committee pointed out that the entire tonnage both of iron and wooden vessels built in the United States in the fiscal year 1879-1880 for the for-

eign, coastwise, river and lake trade was only 157,409 tons, and it urged:

"Now our rapid development in the arts and manufactures forces us to seek an outlet for our surplus products. We should strive with fresh vigor to regain our former maritime position. Our financial condition no longer debars us from the attainment of this end. We have accumulated sufficient wealth to nearly equalize the rate of interest commanded by capital with that of the oldest countries of Europe, thus removing one of the greatest obstacles to the extension of the merchant marine."

To increase shipbuilding the committee made various suggestions. One was that as iron shipbuilding was in its infancy here and an industry natural to the United States, the registry laws should be retained. The committee estimated that the cost of American built steamships would not exceed 10 or 15 per cent. that of those built on the Clyde. The committee declared that the second and greatest obstacle to our foreign shipping interest was the amount of State or local taxes levied upon ship property. This amounted often to as high as 2½ per cent. England imposed no direct taxes upon ship property, but levied a tax of only one per cent. on net profits. A third recommendation was that the United States consular system be improved and made more efficient. A fourth proposal favored a system of subsidies.

Indifference of Inland Sections

But this report had no effect either upon Congress or the nation. Except in some of the seaports there was widespread indifference amounting to apathy. The reason for this general lack of sentiment as contrasted with the spirit of former times was simple. In the decades when nearly all of our

States fronted the ocean or could reach it by navigable rivers, the mass of the population comprehended the importance of maritime development. The agricultural population as well as that of the seacoast had a live interest in the subject and some adequate ideas of the questions it presented. It was this interest that caused the agricultural element to support the building of canals more than 50 of which had been completed. The bulk of these were in the Eastern and Southern States.

With, however, the settlement of the great area of the distinctively inland domain, the interest of people in general turned almost exclusively to land and railways. This was also true of Eastern and Western financiers. The capital of these as well as a mass of investors was continuously attracted to railroad enterprises. In 1880 the total American capital invested in ships engaged in the foreign carrying trade was only about \$100,000,000 as compared with \$4,762,000,000 invested in American railways. A part of this huge railway investment was foreign capital, but the greater part was American. Railway mileage (measured by single track) had increased from 35,085 in 1865 to 93,267 in 1880. In another ten years it was 167,191. For the most part the generation became accustomed to look upon railways as the only kind of transportation worth considering. This accounted for the widespread lack of knowledge of even the rudiments of ocean navigation. There was hardly any popular understanding of what relation it bore to the marketing of our products, or the supplying of necessary imported raw material for our industries.

True, Congress constantly passed what were called river and harbor appropriations. The aggregate of these, by 1917, was estimated at more than \$800,000,000. It is strictly

within the facts to say that many of these appropriations were granted for purely local political considerations, and a great part was absolutely wasted. Moreover, in the carrying out of these projects there was neither system nor policy. At no time was there any definite plan of creating a unified system of connecting river, canal, railroad, lake and ocean transportation.

Torpor of Public Sentiment

Except for protests from Chambers of Commerce and Boards of Trade in different seaports, these anomalous conditions passed without serious comment. America's general sea coast line was 4,883 miles extending along the Atlantic, the Gulf and the Pacific (exclusive of Alaska's 6,640 miles). The shore line of the Great Lakes was 2,985 miles. Yet our merchant marine was so negligible that by 1890 only 12.9 per cent. of the total United States imports and exports was carried in American vessels. In 1880 the total construction for the entire United States was only 157,409 gross tons. In 1886 it was 195,453 gross tons. These were generally small vessels, many of them sailing ships, tug boats, canal boats and barges; thus of the 294,122 gross tons built in 1890, 135,000 gross tons were sailing vessels, canal boats and barges, and of the steam vessels a considerable number were river and tug boats and yachts. That same year there was built in Great Britain a net tonnage of 812,638 of which 664,000 tons were steam vessels.

Meanwhile, along with the decline of our merchant marine, our over-seas trade had enormously increased. From \$604,412,000 in 1865 it had grown to \$1,482,612,000 in 1880 and to \$1,573,567,000 in 1890. But the conveying was mostly done by British, German, French, Norse and Dutch ships.

The creation of a new navy during President Cleveland's first administration was an event that did much in stirring the beginnings of a national sentiment for a merchant marine. Steel had now begun to displace iron in the shipyards of Great Britain, the United States and other countries. But such large shipyards as then were modernized in the United States were organized more with the view of building naval than cargo-carrying vessels.

Signs of a New Era

The Postal Aid Law passed by Congress in 1891 was, although it proved inadequate, of importance in stimulating the building of steel steamships. A number of these were built for the Ward Line and for the Pacific Mail Steamship Company, some in advance of the law, others after its enactment. For this period American steel ship construction reached its highest point when in 1894 and 1895 the *St. Louis* and the *St. Paul* were produced by the Cramp Company. Twenty-five thousand people assembled to witness the launching of the *St. Louis*, on November 12, 1894. These vessels were built entirely of domestic material, signaling a new era in American shipbuilding. In the next few years American shipbuilders were receiving orders not only from foreign firms for merchant ships, but from foreign governments for warships.

Between Atlantic and Pacific ports, however, the old sailing vessels still remained as the only type of freighter. The reason for the survival of clipper ship lines founded nearly half a century before was that there was not enough cargo both ways to justify the establishment of a steam freighter regular service. The preponderance of freight was west bound. In 1882 George S. Dearborn and some associates

who had been connected with a clipper ship line since 1874, had made an unsuccessful attempt to secure capital with which to build sailing vessels with auxiliary steam power. An effort on their part in 1891 to build a full-powered steamer was also without success. It was not until Hawaii was annexed to the United States (July 7, 1898) followed by the extension of the United States navigation laws to that new American territory, that there was sufficient encouragement to build and operate steam freighters. The sugar shipments from Hawaii now provided adequate return cargoes. In 1899 Mr. Dearborn organized the American-Hawaiian Steamship Company. Its first steam freighter, the *Californian*, was 5,500 gross tons. The general opinion among shipping men then was that the venture would be a failure. They did not believe that a steamship line operating 13,000 miles via the Straits of Magellan could compete successfully with the 3,000-mile transcontinental railway routes from Atlantic to Pacific ports. But the Hawaiian sugar shipments increased to such an extent that there was the most urgent demand for more tonnage. In 1905 the American-Hawaiian Steamship Company arranged to trans-ship its freight over the Tehuantepec National Railway, thus saving 25 days in the time between New York and San Francisco. Revolutionary troubles in Mexico, early in 1914, forced the company to resume the Magellan route until the opening of the Panama Canal. Between 1898 and 1914 the company built a total of 27 steam freighters and one cargo-passenger ship. The average capacity of these vessels was 10,000 deadweight tons. The prospective construction of the Panama Canal brought about the establishment by three other companies of steamship lines from Atlantic to Pacific Coast ports. Two of these lines were freighters.

It was the Spanish War in 1898 that first made the American people appreciate the necessity of having a merchant marine as a naval reserve. At the same time the acquisition of the Philippine Islands, Porto Rico and Guam brought about a national realization that the United States had ceased being a purely continental power. The general seacoast line of the United States was now nearly 17,000 miles. A greater interest in maritime affairs permeated the country, especially of those sections long indifferent. Various organizations did much educational work enlightening public opinion.

The Panama Canal

This awakened sentiment was shown in the popular support given to the building of the Panama Canal. Its value both as a trade route and as a strategic necessity was widely recognized. This canal, built at an estimated construction cost of more than \$378,000,000 (not including \$50,000,000 paid for canal rights, and other large sums for fortifications and other items) was opened in 1914. It shortened water routes enormously. It reduced, for instance, the water route from Callao to New York from 9,769 miles to 3,779 miles. It cut the water route from New York to San Francisco from 13,135 miles to 5,262 miles. It abridged the all-water route from New York to Manila via Hawaii from 17,800 to 12,000 miles. It brought Yokohama 3,729 miles, and Sydney, Australia, 3,806 miles, nearer to New York. During the four fiscal years 1914-1918 a total of 5,881 ships (counting vessels going both ways) engaged in sea-going traffic made the transit of the canal. In the fiscal year 1919 the total number of ships making the transit of the canal was 2,025, of which 860 passed from the Atlantic to the Pacific and 1,165 from the Pacific to the Atlantic. Their aggre-

gate net tonnage, according to Panama Canal rules of measurement, was 6,131,575 tons, and the cargo carried by them aggregated 6,877,649 long tons. In addition, 186 vessels of the United States Navy passed through the canal during the fiscal year 1919.

Legislative Awakening

The first real legislation liberally favorable to American shipping interests was the ship registry and other provisions in the Panama Canal Act of 1912. These authorized the admission to American registry of foreign built vessels not more than five years old, and granted the free entry of materials used in the construction and equipment of ships. Soon after the outbreak of the World War on August 3, 1914, Congress saw the imperative necessity of adding vessels as quickly as possible to our merchant marine, thus insuring transportation for our foreign commerce. The Shipping Act of August 18, 1914, removed this age limit. The same act authorized the President to suspend certain provisions of law requiring survey, inspection and measurements by officers of the United States of vessels admitted to American registry. After the declaration of war by the United States against Germany, these and other authorizations were carried into effect by Executive order.

CHAPTER IV

The World War and Shipping Conditions

WHEN the World War suddenly broke out on August 3, 1914, the status of the United States among the foreign commerce carrying nations of the world was deplorably backward.

The entire world tonnage was then 49,089,552 of vessels 100 tons or more. Of this, 45,403,877 gross tons were steam vessels. The United States in 1914 had more than 98,000,000 population. The total national wealth in 1912 (the latest official figures available) was \$187,739,000,000, according to a Government estimate published in the *Statistical Abstract of the United States*, based upon a valuation of various kinds and groups of properties. Of the national income as distinguished from national wealth no official estimate is given. The extent and capacity of the harbors of the United States were unequalled. On the Atlantic Coast were 23 main ports 8 on the Gulf of Mexico, 10 on the Pacific Coast, 25 on the Great Lakes, and others available for routing ocean traffic. For the dredging, building of piers, and other improvements of these ports immense aggregate sums had been spent. The total United States imports and exports carried by sea in the fiscal year 1914 were \$3,785,468,512. Yet of this amount only 9.7 per cent. was carried by distinctively American vessels. There were at this time, however, it should be explained, between 1,500,000 and 2,000,000 tons of foreign shipping owned by American capital, which made this investment because of the cheaper building and operating costs under foreign flags.

In appearance, as far as figures went, the American merchant marine seemed to be larger than it had ever been. In 1914 it totalled 26,943 vessels of 7,928,688 tons. But in point of fact, 6,818,363 tons were in the coasting trade. Other tonnage was in the whale and cod and mackerel fisheries. Only 2,360 vessels of 1,066,288 tons were in the foreign trade.

Progress in Other Countries

Other countries had made striking advances in shipping progress. Germany with its few ports and having less than half the national wealth of the United States, had almost doubled its tonnage from 1900 to 1914. Its merchant marine of 5,764,452 gross tons in 1914 was composed largely of steam vessels of which a large tonnage was ocean-going. Japan's merchant fleet in 1914 was more than three times larger than in 1900, rising from 594,675 tons to 1,866,319 tons, of which 1,680,561 gross tons were steam vessels. Yet Japan's foreign trade was only one-seventh that of the United States. France, with a population of not quite forty millions and a national wealth of \$55,000,000,000, had about doubled its merchant marine since 1890. In 1914, France had 1,922,286 gross tons of steam vessels and 397,152 net tons of sailing vessels. In the modernizing of its merchant marine Norway had made notable progress. In 1890, Norway's merchant fleet had comprised 1,405,934 net tons of sailing vessels and only 245,052 gross tons of steam vessels. By 1914 Norway had 1,914,029 gross tons of steam vessels, and had reduced its sailing vessels to 560,136 net tons. Yet Norway has never been of importance as a ship building country, and its total exports and imports in 1914 were but \$262,000,000. It was as a cargo carrier for other nations that Norway profited.

Italy, Holland, Sweden, Austria-Hungary, Greece, Spain,

and Denmark all had merchant fleets which, if not of individual great figures were, in most cases, considerable, measured by their populations and economic conditions. Lloyd's *Register* for 1914-1915 thus reported of vessels (of more than 100 gross tons): There were under the Italian flag 1,430,475 gross tons of steam vessels and 237,821 net tons of sailing ships. Holland owned 1,471,710 gross tons of steam vessels and 24,745 net tons of sailing ships. Sweden owned 1,015,364 gross tons of steam vessels and 102,722 net tons of sailing ships. Austria-Hungary owned 1,052,346 gross tons of steam vessels and 3,373 net tons of sailing vessels. Under the Spanish flag there were 883,926 gross tons of steam vessels and 14,897 net tons of sailing vessels. Denmark owned 770,430 gross tons of steam vessels and 49,751 net tons of sailing vessels.

Britain's Supreme Rank

Far outclassing that of any other nation or combination of nations was Great Britain's shipping. Its sailing vessels (of 100 tons or more) had been greatly reduced. In 1890 they were: United Kingdom, 3,593 of 2,467,212 net tons; British Colonies, 2,075 of 894,040 net tons. By 1914 they were: United Kingdom, 653 of 364,677 net tons; British Colonies 552 of 156,666 net tons. On the other hand, British steam vessels had greatly increased. Of steam vessels (of 100 tons or more) in 1890 the United Kingdom had 5,574 of 7,774,644 gross tons. In 1914 British steam vessels (of 100 tons or more) amounted to: United Kingdom, 8,587 of 18,892,089 gross tons; British Colonies, 1,536 of 1,631,617 gross tons. In addition, an extensive amount of British capital was invested in Spanish, Greek, Italian, Argentine, and Japanese vessels.

Although not moribund, shipbuilding in the United States

was in an unpromising condition. For years the annual tonnage of all vessels built here was the low average of about 359,000 tons a year. Compared to our trade and resources this was an insignificant output. It was especially so considering that a certain part of that tonnage included sailing vessels and canal boats and barges. In 1914 the production of our yards stood at 316,250 gross tons. Of the 224,000 gross tons of steam vessels built that year, a large part were tugs and river vessels. Barges totalled 75,718 tons. In 1912 Germany launched 375,317 tons of merchant vessels, and in 1913 a total of 465,226 tons. But it was Great Britain that built the bulk of the world's tonnage. The tonnage launched in Great Britain during the five years 1894-1898 amounted to 74.7 per cent. of the world's total output for that period. During the three following quinquennial periods it was respectively 60, 59.8 and 61.1 per cent. Thus, for the fifteen years 1899-1913 Great Britain (including only the United Kingdom) built fully 60 per cent. of the world's shipping output. In the years immediately preceding the war Great Britain's annual ship production was almost 2,000,000 tons (1,803,844 tons in 1911; 1,738,514 tons in 1912; and 1,932,153 tons in 1913)—often between six and seven times greater than that of the United States.

CHAPTER V

The War's Lessons to America

IT WAS the war and its immediate consequences that brought to all sections of the American people a direct, vivid realization of the urgency of our having an adequate merchant marine.

For a number of years the world tonnage had been below the demand. The panic of 1907, with its general dislocation of world trade, had brought about a condition resulting in curtailed ship production. Meanwhile, from 1908 to 1914, the world's volume of trade was constantly expanding, and it was not until about two months before the war's outbreak that the supply of world tonnage was enough to meet the demand. But the great bulk of the supply of steam vessels was owned in the very countries which became involved in war. They owned in 1914, it was estimated, fully 71 per cent. of the world's total steam vessels.

Following the successive declarations of war the effects were at once seen. Germany and Austria withdrew from service 6,187,066 tons of ships. Great Britain requisitioned many of its large merchant steamers for transport services. Likewise France. Russia's merchant marine of about 1,000,000 tons was hemmed in the Baltic and in the Black Seas. The immediate results were therefore the laying up of millions of tons of ships to avoid capture or destruction, and the impressment of other millions of tons of ships as carriers of troops, munitions, and other war supplies.

Many of the ships thus put out of trade service were the

very ships that America had depended upon to convey its normal imports and exports. In the fiscal year 1914 American vessels carried only \$368,359,556 of United States imports and exports. But British ships carried \$2,025,026,751 of American imports and exports, and German, French, Norwegian, Dutch, Italian, Japanese, Belgian, Austrian and other ships carried \$1,392,082,205 of goods entering and leaving the United States. Thus of the total of \$3,785,468,512 of sea-borne United States imports and exports in the fiscal year 1914, \$3,417,108,956 were carried in foreign vessels.

Great Losses to Farmers

Prior to the war the agricultural element as a whole had been concerned only about the movement of crops to the sea board. Under what flag the vessels were conveying their products abroad was a matter that had not seemed of serious import. But now American farmers were brought face to face with the enormous material losses the lack of an American merchant marine meant to them.

This was shown, for example, in the loss to cotton growers. The war's outbreak was quickly followed by a sharp and continuing drop in the price that farmers received for cotton. The increased cotton crop production—about 14 per cent.—had some share in causing this fall. But the demoralization largely came from the widespread disturbed shipping conditions and particularly from the fear that these would steadily grow worse. The price of cotton to farmers on August 1, 1914, was 12.4 cents. By November 1, 1914, it had fallen to 6.3 cents a pound. This was a reduction of nearly one-half. "The cotton crop of 1913," reported the Secretary of Agriculture, in 1915, "averaged to producers 12.5 cents per pound; that of 1914, 7.3 cents, a decline of over 40 per cent. The

total value of the former to producers was \$846,000,000; of the latter \$563,000,000; that is, \$283,000,000 (or one-third) less. . . . Interference with the exportation of cotton did not prove to be as great as in the early part of the season it was apprehended it would be; for by June 30, 1915, the total year's shipments were within eight per cent. of those of the preceding year; but the value had shrunk 38 per cent., or from \$610,000,000 to \$376,000,000."

Little Cargo Space and High Rates

As estimated by money values, exports to Europe greatly increased in the following years, but full allowance should be made for the greatly enhanced prices of products and commodities. The exports also were mainly those which served war purposes in the feeding, clothing and arming of populations. "Estimates by competent shipping interests," reported the *Journal of Commerce*, October 6, 1915, "state that Great Britain, France and Russia are now utilizing 50 per cent. of the cargo space on all steamers leaving Atlantic ports of the United States for transatlantic ports. This applies particularly to the regular steamer lines. The net result is that private shippers are having great difficulty in obtaining any proportion of prompt freight space, despite their willingness to pay high rates." At the same time Italy and Greece, now in the war, were requisitioning steamers for transport use. Vessels were shifted from the South American to the European trade, and every available vessel however old was put to use in the effort to meet the European war demand for American products. But even with these additions there were not enough ships. For instance, extraordinary demands came from various European and South American countries for coal, yet our exports of coal in the fiscal year 1915 were below

those of the fiscal year 1914. So pressing was the demand for tonnage and such was the comparative shortage, that freight rates doubled, trebled, and even soared five to seven times the rate that prevailed before the war. In Pacific as well as Atlantic and Gulf ports freight was congested.

For more than a year after the war in Europe started, ship-building in the United States was at the lowest stage of production it had fallen to in seventeen years. Working at full capacity American shipyards had a maximum output of 750,000 gross tons. Yet in the fiscal year 1915 only 225,122 gross tons were built in American shipyards, and only a little more than half of these were steam vessels. But towards the end of the year 1915 unusual activity began in our shipyards. Orders for ships flowed in from Great Britain, France and Norway. Our own shipping companies placed orders for new ships. Existing shipyards were worked to better capacity and new yards were established. During the year ended June 30, 1916, there were built in the United States 325,413 gross tons, of which 232,524 tons were steam vessels. During the fiscal year 1915 and 1916 a total of 121,074 tons of various kinds of American vessels, many of them schooners and barges, were sold to various foreign nations. But during the same years 608,841 tons were transferred to the American flag.

Our Shipyards Get Busy

By 1915 the total merchant marine of the United States was 8,389,429 tons. The actual increase of 1915 over 1914—460,741 tons—was brought about only by a transfer of 523,361 tons to the American flag under the provisions of the Shipping Act of August 18, 1914. Deducting the 18,595 tons transferred from the American flag that year, this left an

added registry in our favor of 504,766. Had it not been for this addition, there would have been a serious decrease, as the construction that year was almost offset by lost or abandoned ships. In 1916, 83,480 tons were transferred to the American flag; and against the 325,413 gross tons of American vessels built there were 193,104 tons of lost and abandoned ships. Consequently, in 1916, the increase to the American merchant marine was hardly perceptible. The total stood at 8,469,649 tons. The factor that year adding to our total merchant marine was increased construction.

The fact that our 1916 merchant marine showed such a slight increase over 1915 was due directly or indirectly to the war. In 1916 there were sold to aliens 102,479 tons of American vessels, whereas in all previous years since the Civil War the annual sale of vessels to aliens had been usually very small. During the same year—1916—only 29,070 tons of foreign shipping were sold to the United States. In addition, the losses to the American merchant marine since the war's outbreak from vessels abandoned or lost had greatly increased over the pre-war period. In the two fiscal years 1915-1916 a total of 404,533 tons of American ships had been lost or abandoned. These included 16,876 tons sunk by Germany. From the very outset of the war the demand for ships had been so pressing that many old and obsolete ships had been put into service. These, of course, soon showed the effects of the cumulative strain of war times, and many had to be abandoned.

Great Shortage in World Tonnage

With the stupendous demand for American products, the world's sea-carrying tonnage was desperately deficient. Fully 4,500,000 tons of shipping, it was computed, were in 1916 and

early in 1917 held in ports to avoid capture or other risks. It was estimated that perhaps 12,000,000 tons of shipping were constantly used in war-carrying service by the Allies. Up to February, 1917, when Germany started indiscriminate submarine warfare, about 4,391,000 gross tons of world shipping had been destroyed by war operations. These losses were partly made up by shipbuilding activities in various countries. It is difficult to say what the exact net shortage from these causes then was. But there was one clear aspect of the shortage. In peace times the average yearly increase in the world's steam sea-going merchant tonnage was about five per cent. In 1914 the world's seagoing tonnage was 45,403,000 gross tons. Had this annual increase gone on, the total world steam tonnage in 1917 should have been 52,150,000 tons or more. As the world's steam tonnage had not increased, this falling off alone made a shortage in that tonnage of more than 7,000,000 tons.

Moreover, there was another kind of shortage adding materially to the problem. In peace times the wastage and extension of life of merchant ships called for the equivalent of an annual world output of two to three million tons. Of this production about 50 per cent. had hitherto come from British ship builders. In war times the wastage, because of unavoidable strain, hard usage and inadequate opportunity for proper maintenance, is always much greater, and on this score alone demanded a correspondingly greater production than in peace times.

These were approximately the world shipping conditions late in 1916 and in the beginning of 1917.

CHAPTER VI

America Becomes a Great Ship Producer

WITHIN less than a year after the great conflict in Europe began sentiment in the United States showed such evidence of being aroused in favor of creating a large American merchant marine that the Merchant Marine Committee of the National Foreign Trade Council felt itself justified in reporting on September 23, 1915: "Your committee interprets public interest in the subject of the Merchant Marine as meaning that an earnest desire exists on the part of Americans to share to a greater extent in the oversea transportation of exportable commodities. . . ." This committee, composed of Robert Dollar, James A. Farrell and P. A. S. Franklin, recommended that Congress establish a permanent Shipping Board. This body, it urged, should act in an advisory capacity. It should be empowered to recommend to Congress measures to promote the growth of American shipping and maintain it on an equitable competitive basis with that of other nations, "always having due regard for the maintenance of American standards of living and compensation and keeping in view the needs of national defense and the necessities of the foreign trade." This proposal was approved by other commercial bodies and different organizations.

The Shipping Board Established

On September 7, 1916, Congress passed an act creating the United States Shipping Board. As originally designed, the purpose was to further more effectively the development of

the American merchant marine and to regulate foreign and domestic shipping. With the approach of war, the Shipping Board was, on February 5, 1917, by Presidential proclamation of national emergency, given control over all vessels registered by the United States.

The United States declared war on Germany on April 6, 1917. With our definite entry into the war the need of a great merchant marine assumed a variety of new aspects. The winning of the war became the prime, dominating consideration. Costs were held a subordinate matter. While America was forming armies it was vitally necessary, as a war act of the first importance, to rush food and other supplies to Allied countries. Hard pressed by Germany's submarine campaign, they were on short rations and calling desperately for ships. In 1916 Great Britain had been able to build only 608,235 tons of ships. In fact, during the war period, as a whole, Great Britain's contribution to the world's mercantile output was only 38.6 per cent.—a decline of about 22 per cent. in its shipbuilding since the period just before the war. Many other nations, neutral as well as belligerent, had suffered heavy losses in tonnage. Our armies and vast equipment had to be transported to Europe, provision made for their return, and an unbroken flow of supplies assured. For war and civil needs the United States had to maintain its importation of necessary raw material from various parts of the world. Added to these factors was the enormous trade demand for American products.

Increase of Shipyards

When the United States entered the war there were in this country only 61 shipyards for sea-going ship construction. Of these, 37 were steel shipyards with 162 ways, and 24

wood shipyards with 73 ways. In 1916 about 50,000 men were employed in the American shipbuilding industry. In April, 1917, there were about 75,000. All of the yards were under pressure with orders from private interests, American and foreign. American shipyards, in the fiscal year ended June 30, 1917, built for private owners 1,297 merchant ships of 664,479 gross tons. This was more than double the tonnage built in the previous fiscal year. Of that 1917 production, 431,304 gross tons were steel steamers. Besides, there were also built for foreign owners and delivered to them 40 vessels of 134,895 gross tons. On July 1, 1917, there were 43 steel shipyards building or under contract to build for private owners, either American or foreign, 499 merchant steel ships of 1,896,522 gross tons. Wooden shipyards had contracted to build 172 ships of 245,763 gross tons. The revival of the wooden ship was one of the picturesque outgrowths of the war. There was no expectation that it would be a permanent factor; it was intended solely to help out the grave deficiency in cargo-carrying tonnage.

The year 1917 was, in fact, the first real auspicious year for American shipyards and our merchant marine. Notwithstanding the transfer, because of high rates offered abroad, from the American flag of 197,370 tons (offset by the buying of only 4,637 tons and the transfer to the American flag of 86,355 tons), the sinking of 71,382 tons, and the loss or abandonment of 159,248 tons, our merchant marine increased to 8,871,037 tons.

One feature of this increase was the growth of American registered tonnage in the foreign trade. It rose from 2,755 vessels of 1,862,714 tons in 1915 to 3,101 vessels of 2,185,008 tons in 1916, and to 3,453 vessels of a total of 2,440,776 tons in 1917.

Emergency Fleet Corporation

On April 18, 1917, the United States Shipping Board established an auxiliary, The Emergency Fleet Corporation, with a capitalization of \$50,000,000. An Executive order, issued on July 11, 1917, by President Wilson, under an act of Congress of June 15, 1917, gave the Emergency Fleet Corporation power to construct, purchase and requisition vessels. The power now vested in the Shipping Board was, as regards merchant ships, practically unlimited. Congress at different times appropriated vast sums for merchant shipbuilding, and subject to this the Shipping Board could draw at will upon the resources of the United States Treasury. In July, 1917, Chairman William Denman and three other members of the Shipping Board resigned following a long-pending dispute as to whether in the urgency steel or wood ships should be built. New Commissioners were appointed, and of these Edward N. Hurley was elected Chairman of the United States Shipping Board. The energetic work of the Shipping Board dated from this reorganization.

Our Merchant Marine's Expansion

Summarizing the status and growth of the American merchant marine during the war, the fact first to be noticed is that the United States merchant vessels requisitioned by the Shipping Board's order of October 12, 1917, and later requisitionings were vessels then in actual service. These, by September 1, 1918, comprised 873 steamers (including tankers) of a total of 2,791,179 gross tons. The great expansion of our merchant marine during this period may be described as embracing six general groups. They were:

1. Seized German and Austrian ships. There were 89 German steamers of a total of 583,435 gross tons, and 1 Austrian steamer of 8,312 gross tons.

2. Commandeered Dutch vessels in American ports. The United States Government took over 87 ships of a total of 354,479 gross tons. But although under the United States flag, these were officially considered as foreign vessels chartered to the United States. (Since the war all of these have either been returned to Dutch owners or are in process of return).

3. Foreign vessels either chartered to the United States Shipping Board or under agreement with it. The total of these was 161 ships of 687,222 gross tons.

4. Foreign vessels chartered to United States citizens. A total of 223 ships of 575,447 gross tons.

5. Ships commandeered on American ways. On August 3, 1917, the Emergency Fleet Corporation of the United States Shipping Board commandeered in American shipyards all hulls and material in course of construction for steel cargo-carrying vessels exceeding 2,500 deadweight tons capacity. The object of this order was to prevent a large tonnage from passing into foreign ownership, and to acquire complete control over the American shipbuilding industry. This commandeering order originally comprised 437 ships. Some commandeerings were released, others cancelled, still others transferred to the contract class, leaving 402 ships of 2,790,792 tons as the total commandeered ships under construction.

6. New ships contracted for by the United States Shipping Board. The total called for 3,164 ships of 17,515,481 deadweight tons (11,676,000 estimated gross tons). Of these contracts, 782 covering 3,899,925 deadweight tons were suspended or cancelled by July 1, 1919. This left at that date a construction program of 2,382 ships of 13,615,556 deadweight tons (9,076,572 estimated gross tons).

CHAPTER VII

Ships, the Nation's Leading Aim

AMERICA'S shipbuilding activities during the war were the most remarkable ever shown in any time or country. The nation was in a fervor of intense patriotism. There was a fixed determination to defeat Germany at any cost, and it was popularly realized that above all things ships were imperative. Many of the ablest practical shipping men and leaders of industry were either members of the Shipping Board or in charge of its divisions or co-operating with its work. They voluntarily relinquished large private interests to help in the work of planning, developing and operating a huge merchant fleet.

Under the increasing pressure of war's necessity methods radically different from the regular business practices of peace times were resorted to. At first the Shipping Board requisitioned ships at prices for which contractors had agreed to build them. The price of materials, however, kept constantly rising, and the demands of labor for higher wages to meet the advancing cost of living became more insistent. To avert labor difficulties and delays to production, the Shipping Board granted increased wages and adopted the cost plus percentage system. This guaranteed the contractor the cost of building and a fee ranging from three to seven and a half per cent. of the estimated cost with a bonus if the cost was less than that estimated or for early delivery. This system, according to a recent statement of Chairman Hurley, while considered necessary at the time was of doubtful value and

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not one that could be recommended for the normal industry of peace times when cost is the pivotal desideratum. To provide for the speedy establishment of new shipyards, the Shipping Board in many cases supplied the capital, guaranteed the wages and assured the profits. By October 15, 1918, the Shipping Board had made commitments amounting to \$3,-446,679,414 out of a total of \$3,671,000,000 authorized by Congress. Nearly \$480,000,000 went for requisitioned ships. Commitments for contract ships amounted at that date to \$2,681,963,000. Approximately \$150,000,000 were invested or under contract to be invested in shipyards. To provide housing facilities for shipyard workers \$68,000,000 were spent. Other expenditures covered different items.

"Fabricated" Shipyards

So rapidly under this munificent policy did new shipyards spring up that before hostilities ceased there were 341 shipyards for sea-going ship construction in the United States. They were all in a practically completed state and had a total of 1,284 launching ways. This was more than double the number of shipways owned by the total of all other nations. Nor did these figures include the numerous yards in the United States building schooners, barges, and other small craft for private account. Some of the new merchant vessel shipyards were of an entirely new type, "fabricated" shipyards. In place of the old method of wholly building a ship in a yard, the plan was now devised of preparing all parts in steel-fabricating shops and assembling them in the shipyard. Standardization of design allowed many steel mills to prepare plates on the same pattern. Three great "fabricated" shipyards were established at Hog Island, near Philadelphia, at Camden, New Jersey, and at Newark Bay

by Government funds but operated by private corporations. Contracts were made with other concerns for the building of ships fabricated wholly or partly outside the shipyard.

Legions of Shipworkers

The most pressing need was for shipyard workers. Our force of experienced men of this kind had for years been comparatively small. But it was believed that American mechanical skill in other lines could be adapted to shipbuilding. A patriotic appeal was made for an army of 250,000 workers to be enrolled within ten days for shipbuilding service. Fully 285,000 men responded. In September, 1918, there were 81,723 wood and composite shipbuilders and 277,159 steel ship builders at work in American shipyards.

The entire nation was passionately absorbed in the progress of our ship production, and followed it with keenest exhilaration. Month by month the output increased. In the first six months of 1917 American shipyards produced 491,983 gross tons. In the last half of the year 1917 the production of American yards was 542,313 gross tons, making the production for the whole year 1,034,296 gross tons of which 605,738 gross tons were sea-going steel steamers and 211,830 gross tons were sea-going wood vessels. There were 216,728 gross tons of non-sea-going vessels.

By June 30, 1918, our merchant fleet was 9,924,518 gross tons, 4,292,405 gross tons constituting sea-going vessels of 1,000 tons or more. But these bare figures give no proper index to our true construction progress. Our actual merchant marine losses that fiscal year were 396,180 tons of which 180,000 had been sunk by the enemy. During the same year 363,742 tons had been transferred to the American flag, and 63,160 from the American flag. The ship construction in

American yards for the fiscal year was nearly twice that of 1917, more than three times that of 1916 and more than four times that of 1915. Yet the need of ships was so enormous that it was only by the aid of British ships that the more than 2,000,000 American soldiers were transported abroad. In 1918 British ships conveyed more than half of our troops.

CHAPTER VIII

A Notable Construction Record

IT WAS not until the latter part of 1918 that the results of America's extraordinary shipbuilding undertakings began to show more fully. Great Britain's production (not including colonies) in the calendar year 1918 was 1,348,120 tons. Japan, now prominent as a shipbuilder and partly on contracts from the United States, had an output in the calendar year 1918 of 489,924 tons as against 350,141 tons in 1917 and 145,624 tons in 1916. In the calendar year 1918 the United States produced more than 3,000,000 gross tons. Lloyd's *Annual Summary of the Mercantile Shipbuilding of the World*, in February, 1919, reported of the United States:

"The output for the year 1918—viz.: 3,033,030 tons gross—is a convincing proof of the great development in the shipbuilding industry which is generally known to have taken place in this country. This total for one year is higher than the whole output of the United States during the ten years 1907-1916; it is more than three times the amount launched during 1917, and it exceeds by over 25 per cent. the combined output of the rest of the world for the year 1918.

"The most striking increase has taken place in the yards on the Pacific Coast. The average yearly output on that coast during the four years 1912-1915 was under 30,000 tons; in 1917 it amounted to 428,622 tons, and during 1918 it reached 1,514,296 tons. Of the total launched on the Great Lakes (430,877 tons) only one steamer of 5,429 tons is for trade on those lakes, all the other vessels being intended for sea-going purposes."

But even that summary did not give an adequate depiction of the great development of the American shipbuilding industry. Some of our largest shipyards, particularly on the Atlantic Coast, were busy at the same time building warships for the largest naval program in American history. These warships covered a total of about 900,000 tons displacement. After the armistice with Germany, November 11, 1918, the number of wood shipbuilders steadily decreased, while the force of steel shipbuilders increased until in April, 1919, there were 324,805, or 29,000 more steel shipbuilders than on the day of the armistice. On July 1, 1919, the Shipping Board was operating 178 shipyards, and the number of employes was 260,315. These figures did not include shipyards building naval vessels or the shipyards building small craft.

The output of seagoing ships built in American shipyards, in the fiscal year ended June 30, 1919 was: Steel vessels, 626 of 2,725,196 gross tons; wood, 481 of 1,021,020 gross tons—a total of 1,137 seagoing ships of 3,746,216 gross tons. The grand total, including non-seagoing ships, built in American yards during that fiscal year was 2,241 ships of 3,860,484 gross tons. Almost all of these seagoing ships were built for the United States Shipping Board.

Ship Losses of Various Nations

With the cessation of war it became possible to ascertain the approximate state of the world's tonnage.

A detailed report, based on data furnished by the British Ministry of Shipping, showing the exact losses sustained by the British merchant marine from August 4, 1914, to November 11, 1918, was submitted to the House of Commons. The report showed that 2,479 British vessels, representing 7,759,-

090 gross tons, were lost during the war. Submarines caused the loss of 2,099 vessels. Cruisers destroyed 117 vessels; 259 vessels were sunk by mines; and four vessels were destroyed by aircraft. Submarine sinkings caused the loss of 12,723 lives, and mines of 1,493 lives. The total gross tonnage lost because of submarine attacks was 6,635,059. Mines caused the loss of 673,417 gross tons. The report disclosed the interesting fact that 1,185 British vessels of 8,007,967 gross tons were molested or damaged but not sunk.

According to Lloyd's *Register of Shipping*, the losses of merchant steamers of the principal maritime nations, during the World War, from August 4, 1914, to the Armistice of November 11, 1918, were:

COUNTRY	WAR LOSSES	MARINE LOSSES	TOTAL
	Gross Tons	Gross Tons	Gross Tons
United Kingdom	7,753,311	1,032,779	8,786,090
British Dominions	169,712	99,866	269,578
American	343,090	187,948	531,038
Belgian	85,842	19,239	105,081
Brazilian	20,328	10,951	31,279
Danish	210,880	34,422	245,302
Dutch	201,797	27,244	229,041
French	722,939	84,138	807,077
Greek	349,661	65,014	414,675
Italian	745,766	115,669	861,435
Japanese	119,764	150,269	270,033
Norwegian	976,516	195,244	1,171,760
Spanish	157,527	80,335	237,862
Swedish	180,415	83,586	264,001
Total	12,037,548	2,186,704	14,224,252

The foregoing figures apply to the four years and four months of the World War. During the five calendar years covering that period the world's output of ships was 14,127,701 gross tons, of which less than three per cent. were sailing vessels. The net effect of the World War, therefore, was:

STEAM TONNAGE OF 100 TONS AND UPWARDS OWNED BY
THE PRINCIPAL MARITIME COUNTRIES BEFORE
AND AFTER THE WORLD WAR

COUNTRY	JUNE, 1914	JUNE, 1919	DIFFERENCE BETWEEN 1914 AND 1919	
	Tons Gross	Tons Gross	Tonnage	Per- centage
United Kingdom . .	18,892,000	16,345,000	-2,547,000	-13.5
British Dominions .	1,632,000	1,863,000	+231,000	+14.1
United States:				
Seagoing	2,027,000	9,773,000	+7,746,000	+382.1
Great Lakes . . .	2,260,000	2,160,000	-100,000	-4.4
Austria-Hungary . .	1,052,000	713,000	-339,000	-32.2
Denmark	770,000	631,000	-139,000	-18.1
France	1,922,000	1,962,000	+40,000	+2.1
Germany	5,135,000	3,247,000	-1,888,000	-36.8
Greece	821,000	291,000	-530,000	-64.6
Holland	1,472,000	1,574,000	+102,000	+6.9
Italy	1,430,000	1,238,000	-192,000	-13.4
Japan	1,708,000	2,325,000	+617,000	+36.1
Norway	1,957,000	1,597,000	-360,000	-18.4
Spain	884,000	709,000	-175,000	-19.8
Sweden	1,015,000	917,000	-98,000	-9.7
Other Countries . .	2,427,000	2,552,000	+125,000	+5.2
Total Steam Tonnage	45,404,000	47,897,000	+2,493,000	+5.5

In the Notes on the 1919-1920 edition, Lloyd's *Register of Shipping* in publishing the foregoing figures points out that during the war camouflage as regards losses was necessary but that now a careful estimate of losses can be made public.

The grand total of the world's tonnage in June, 1914, was 45,404,000 gross tons of steamers and 3,686,000 net tons (equal to approximately 4,050,000 gross tons) of sailing vessels. In June, 1919, the world's total was: Steam tonnage, 47,897,000, and sailing tonnage 3,022,000. In those five years the world's steam tonnage had increased by nearly 2,500,000 tons, while the sail tonnage had decreased by about 1,030,000 gross tons.

Apparently, the war notwithstanding, there was a considerable increase in the world's steam tonnage. Nominally there was compared to the 1914 figures. But the question of the world's tonnage loss or gain is not to be determined by a comparison of those years but by the factor of the annual normal increase had there been no war. In making a careful estimate for the different maritime countries and for the world, Lloyd's *Register of Shipping*, after giving the figures as to what these normal increases would have been, concludes that the world tonnage by June, 1919, should have been 55,370,000 tons. Estimated on the basis of what the figures would have shown had there been no war, Lloyd's finds that the loss of British tonnage (including Dominions) amounted to 5,202,000 tons and the loss of other countries (except the United States) to 9,000,000 tons,—a total loss of 14,202,000 tons. As against this there was, allowing for all factors, a net gain of 6,729,000 tons to United States tonnage, representing a gain of 7,168,000 sea-going tonnage and a loss of 439,000 Great Lakes tonnage. This made a net world's loss of 7,473,000 tons.

World Shortage 8,500,000 Tons Gross

But the actual loss was larger, as Lloyd's goes on to explain. The United States was, estimating on the basis of the average normal increase had there been no war, the only country which increased its merchant marine. Lloyd's statement continues:

"Comparing individual countries it is seen that by far the largest loss has been incurred by the United Kingdom, the tonnage of which is probably now over 5,000,000 tons less than it would have been but for the war. Excluding enemy countries the greatest sufferers after the United Kingdom are Norway to the extent of over 1,000,000 tons, Italy 677,000 tons and France 536,000 tons. The German loss is, as already explained, less than the final figures will show when they are available * * *

"The increase in the case of Japan is but slightly higher than would have occurred under ordinary conditions.

"The question of efficiency of the present steam tonnage has not been taken into account in the above figures. Quite apart from additions to the merchant fleets of the world, before the war, replacements of steam tonnage lost, broken up, etc., amounted each year to about $1\frac{1}{2}$ percent. of the total tonnage owned, while during the war to replace the tonnage lost involved the construction of new tonnage equal to 33 per cent. of the steam tonnage owned in 1914. Owing to these reasons there is no doubt that a large amount of tonnage is now in existence, which under ordinary conditions would have been broken up and replaced by more modern and more economical vessels.

"These remarks apply to the United Kingdom to a much greater extent than to other countries. During the three

pre-war years 1911-1913, close on two million tons of steamers were sold foreign, and of course replaced by better vessels, while during the three years 1916-1918 probably less than 100,000 tons of steamers were sold in this way.

"Moreover, it should be remembered that a large proportion of the tonnage built during the war is not equal in general efficiency to the tonnage which was built in the last few years prior to the war.

"Taking these considerations into account, it may reasonably be asumed that the world has lost through the war no less than $8\frac{1}{2}$ million tons gross of shipping, which represents a deadweight carrying capacity of about $12\frac{1}{2}$ million tons."

CHAPTER IX

Our Powerful New Merchant Fleets

PEACE brought a modification of the construction program of the United States Shipping Board, causing suspension and cancellation of a considerable number of contracts. Excluding these suspensions and cancellations of contracts for 782 ships of 3,899,925 deadweight tons, the remaining construction program left 2,382 vessels of a total of 13,585,556 deadweight tons (about 9,000,076 estimated gross tons). The status of these on July 1, 1919, is shown in a table presented on the following page. This table is condensed from an elaborate one published by the Division of Planning and Statistics of the United States Shipping Board.

Analyzing the different types of vessels contracted for, it will be seen that almost all were designed as cargo carriers. The Shipping Board had consistently held to the program of building ships for present and future commercial purposes as well as for the exigencies of war. One of its leading objectives was the planning for the carrying of at least 50 per cent. of American foreign commerce in American vessels. Of the 1,678 steel vessels on the contract program, 939 were cargo vessels, 5,000 tons and over, and 482 were steel cargo vessels under 5,000 tons. In addition, there were 49 steel cargo vessels contracted for in Japan and China. Contracts for American construction further included 32 steel passenger cargo vessels; 114 steel tankers (eight hulls of which were finished as sailing vessels); 19 steel refrigerating vessels, and 56 steel tugs, 5 steel barges and one steel schooner. For

Construction Program of Emergency Fleet Corporation, as of July 1, 1919,
(Excluding Suspensions and Cancellations)

TYPE	CONTRACTED FOR AND COMMANDEERED TO CONTRACTS		DELIVERED AUG. 1, 1917 TO JULY 1, 1919		BEING FITTED OUT IN WET BASIN		ON WAYS		BALANCE ON ACTUAL CONTRACTS NOT STARTED	
	Total No.	Total Dwt.	No.	Dwt.	No.	Dwt.	No.	Dwt.	No.	Dwt.
UNITED STATES CONSTRUCTION:										
Steel	1,678	11,217,376	770	4,855,464	215	1,377,699	399	2,902,423	294	2,082,150
Wood	623	1,831,650	268	939,700	221	615,450	134	276,500		.....
Concrete	14	88,500	.....	.....	3	18,000	9	55,500	2	15,000
Composite . . .	18	63,000	12	42,000	6	21,000	.....	.....		.....
U. S. Total . .	2,333	13,200,886	1,050	5,837,164	445	2,032,149	542	3,234,423	296	2,097,150
FOREIGN CONSTRUCTION:										
Japan—										
Contract Steel Cargo	30	245,850	.....	.....	.....	.....	13	114,900	17	130,950
Purchased Steel Cargo	15	128,820	15	128,820	.....	.....	.....	.....	.....	.....
China—										
Contract Steel Cargo . .	4	40,000	.....	.....	.....	.....	4	40,000	.....	.....
FOREIGN TOTAL . .	49	414,670	15	128,820	.....	.....	17	154,900	17	130,950
GRAND TOTAL . . .	2,382	13,615,556	1,065	5,965,984	445	2,032,149	559	3,389,323	313	2,228,100

purely military and naval service there were contracted for 21 steel transports and 9 steel colliers. The wood vessel contracts covered 307 wood cargo vessels, and 316 other wood vessels including tugs and barges. Of the concrete vessels six were designed as cargo carriers and eight as tankers. Of the 18 composite vessels 17 were especially designed as cargo carriers.

Our Big Sea Fleets a Reality

The great expansion that the American merchant marine reached by July 1, 1919, is shown by the number of sea-going vessels under the United States flag at that date. There was a total of 2,506 vessels, of 500 gross tons and over, aggregating 8,106,956 gross tons. Of these, there were 2,388 vessels of a total of 7,791,870 gross tons under the United States flag and controlled by the United States, and there were 118 vessels of a total of 315,086 gross tons under the United States flag but foreign controlled. There were also 161 foreign vessels of a total of 687,222 gross tons controlled by the United States, and 223 foreign vessels totalling 575,447 gross tons chartered to American citizens, making a total of 384 foreign vessels of 1,262,669 gross tons controlled by the United States. Including other vessels either rechartered to foreigners or not chartered to the United States, the total of foreign-controlled foreign vessels trading with the United States was 1,296 of an aggregate of 5,848,716 gross tons.

Of the complete total, therefore, of 4,186 vessels, of 500 gross tons or over, of 15,218,341 gross tons trading with the United States, more than one-half of both vessels and tonnage was owned by the United States government or its citizens. The 2,506 vessels totalling 8,106,956 gross tons thus under the American flag comprised:

117 vessels of a total of 320,231 gross tons owned by the Army, Navy and other Government Departments.

913 vessels totalling 3,562,460 gross tons owned by the Shipping Board.

1,387 vessels totalling 3,640,830 gross tons owned by American citizens. Of this total 72 vessels of 502,798 gross tons were under requisition, and the remainder—1,315 vessels of 3,137,852 gross tons were not under requisition.

89 seized enemy ships of a total of 583,435 gross tons, controlled by the Shipping Board.

The ocean-going vessels of 500 gross tons or more in operation under the American flag on July 1, 1919, comprised:

359 freight and passenger steamers,	
totalling	1,344,505 gross tons
29 freight, passenger and refrigerator,	
totalling	150,198 gross tons
1,488 freight, totalling	4,960,800 gross tons
27 freight and refrigerator, totalling .	152,513 gross tons
188 steam tankers, totalling	1,013,051 gross tons
415 sailing ships, totalling	485,889 gross tons

These 8,106,956 gross tons included 118 vessels of 315,086 gross tons under the American flag but foreign controlled. Deducting the foreign controlled left 2,388 vessels of 7,791,870 gross tons under the United States flag and controlled by the United States. There were also under United States control 384 foreign vessels of 1,262,669 gross tons.

Of the steamers (not including tankers) entirely under the United States flag and control 837 of a total of 2,897,850 gross tons were engaged in the general commerce of the seas to all continents. There were 369 steamers totalling 1,755,647 gross tons in the United States Army, Navy, Railroad, European Relief and other service. In the Philippine and

Hawaiian service there were 44 steamers of a total of 59,405 gross tons. In the United States Coastwise service there were 270 steamers totalling 561,232 gross tons. Ten steamers were in recruiting and cable repairing service. Under repair and not reported normally from destination were 313 steamers totalling 1,125,629 gross tons.

The question now arises: What, according to the latest available data, will probably be the extent of the ocean-going American merchant marine in the near future?

America's Ship Program

On July 1, 1919, there were, as above stated, 2,388 sea-going vessels of a total of 7,791,870 gross tons under the United States flag and controlled by the United States. On the same date there were, excluding suspensions and cancellations of contracts, outstanding contracts of the Emergency Fleet Corporation for 1,317 ships of a total of 5,099,714 gross tons. If the construction program in force at that date is fully carried out, these figures would indicate a total American sea-going merchant marine in excess of 12 million tons. Including the Great Lakes vessels, the American merchant marine, estimated on the foregoing basis, will be about 13 million gross tons. This estimate does not include the private contracts that have recently been placed in American shipyards for ships. Practically all of these are for American interests.

But these figures give only a partial idea of the full extent of the American merchant marine. Including river and other craft, the American merchant marine, already, on June 30, 1919, totalled nearly 13,000,000 gross tons. The growth of American shipping since 1914 is shown in the table on the following page, prepared by the United States Commissioner

of Navigation. It comprised all American vessels under register, enrollment and license, on June 30, 1919.

GROWTH OF AMERICAN SHIPPING
(Gross Tonnage)

JUNE 30	FOREIGN TRADE	COASTING TRADE		TOTAL
		Great Lakes	Sea and River	
1914 . . .	1,076,152	2,882,992	3,969,614	7,928,688
1915 . . .	1,871,543	2,818,000	3,699,886	8,839,429
1916 . . .	2,191,715	2,760,815	3,517,119	8,469,649
1917 . . .	2,446,399	2,769,824	3,654,814	8,871,037
1918 . . .	3,603,706	2,708,523	3,612,289	9,924,518
1919 . . .	6,669,726	2,635,680	3,601,894	12,907,300

Of the nearly 13,000,000 gross tons of shipping under the American flag, on June 30, 1919, there were 7,300,000 gross tons of seagoing ships of over 1,000 tons gross. From June 30, 1919, to November 1, 1919, there were documented about 1,500,000 gross tons of American shipping, both Government-owned and private-owned. In addition, the United States Shipping Board had on its program (allowing for cancellations), about 4,000,000 gross tons incomplete. Including the private contracts for ships recently placed in American shipyards, present indications, therefore, point to a total American merchant marine, in the near future, of about 18,000,000 gross tons. This estimate makes a certain allowance for ships sold for foreign account.

The Third Annual Report of the United States Shipping Board, issued December 15, 1919, reported that up to June

The United States Shipping Board estimated that the comparative expenditures of the Emergency Fleet Corporation's program carried to completion would total:

For administration	45,000,000
For transportation	10,125,309
For housing	68,485,700
For dry docks and marine railways	20,294,394
For plants	168,413,797
For ships	3,087,418,087
Total	\$3,399,737,287

Ship Sales by U. S. Shipping Board

The status of ship sales by the United States Shipping Board, up to December 24, 1919, was: The sale of approximately 35 new steel sea-going ships was reasonably sure, and there were negotiations under way for the sale of 18 more new steel sea-going ships to companies controlled by Charles W. Morse. Of the 35 ships, the sale of which was fairly certain, 12 were from 3,000 to 4,000 deadweight tons; three from 4,000 to 5,000 deadweight tons; three from 5,000 to 6,000 deadweight tons; nine from 7,000 to 8,000 deadweight tons; five from 8,000 to 9,000 deadweight tons; two from 9,000 to 10,000 deadweight tons; and one was over 10,000 deadweight tons. The 18 ships being negotiated for by the Morse interests varied from 8,800 to 9,500 deadweight tons. In nearly all cases the price was from \$200 to \$225 a deadweight ton; one exception was a refrigerator which was sold at \$255 a deadweight ton; and other exceptions, where the price was lower than the \$200-\$225 rate, were impaired vessels. A number of steel ships were also reconveyed to private interests.

In addition, 18 new wooden ships were sold, and others were time chartered under purchase agreement. Of composite vessels, four were sold outright, and six more were chartered under purchase agreement. About 19 reconstructed Lake ships were sold "as is" (in the condition that they were at the time of sale) at varying prices, and under varying terms. One requisitioned steel ship of 2,550 deadweight tons was sold at \$150 per deadweight ton, and one requisitioned wooden ship of 2,500 deadweight tons was sold "as is" for about \$10,000. Of the ex-Austrian ships, four ranging from 5,700 to 8,200 deadweight tons, were sold "as is" for \$147.50 a deadweight ton; one of about 6,000 deadweight tons was sold "as is" for \$165 a deadweight ton; and one of about 2,000 deadweight tons was sold "as is" for \$87,000 cash. Two ex-German ships were sold—one of 3,250 deadweight tons for \$100 a deadweight ton, and one of 2,500 deadweight tons for \$120 a deadweight ton. Also, eight tugs and 13 barges were sold.

The only vessels sold that have been transferred to foreign flags have been some of the reconstructed Lake boats. A strict rule was established by the United States Shipping Board that no ship over 4,000 deadweight tons should be transferred to foreign registry.

Sea-Going Tonnage

"One of the most striking results," said Lloyd's, "of the comparison of the 1919 and 1914 figures is the relative position of the United Kingdom and the United States. In 1914, 41.6 per cent. of the world's tonnage was owned in the United Kingdom, and 4.46 per cent. was composed of sea-going tonnage of the United States. The present figures (July 1, 1919), are: United Kingdom, 34.1 per cent.; United

States, 24.9 per cent., including 20.4 per cent. of the sea-going tonnage."

By October 1, 1919, the total sea-going American merchant marine of 500 gross tons and over comprised, as stated by the Bureau of Navigation of the Department of Commerce, 2,991 vessels of 9,352,945 gross tons as follows:

	<i>Vessels</i>	<i>Gross</i>	<i>Net</i>
Vessels 1,000 gross tons and over:			
Steam and gas	1,988	7,928,260	5,178,176
Sailing	346	558,835	512,686
Vessels 500 gross tons and over:			
Steam and Gas	155	113,376	72,022
Sailing	442	340,950	296,810
Total	2,931	8,941,421	6,059,694
Additional vessels of 500 gross tons and over adapted for merchant service transferred to the Navy or the War Department since April 6, 1917	60	411,524	231,667
Grand Total	2,991	9,352,945	6,291,361

The American merchant marine's steel steamers of 1,000 gross tons and over increased from 429 vessels of 1,589,733 gross tons on June 30, 1914, to 1,628 vessels of 7,051,440 gross tons on October 1, 1919.

Obviously, with the great growth of the American merchant marine, the percentage of United States imports and exports carried in American vessels has rapidly increased. From 9.7 in 1914 when the total of United States imports and exports by sea were \$3,785,468,512, it rose to 21.9 per cent. in 1918 when our sea-borne foreign trade was \$7,703,700,456. In the fiscal year ended June 30, 1919, American vessels carried 27.8 per cent. of the total United States sea-

borne imports and exports of \$8,952,552,802. Of the total of \$2,617,192,315 sea-borne United States imports in the fiscal year 1919, American vessels carried 33.5 per cent. In previous fiscal years American vessels carried, of our sea-borne imports, 27.8 per cent. in 1918; 27.5 per cent. in 1917; 22.5 per cent. in 1916; 18.4 per cent. in 1915; and 11.4 per cent. in each of the fiscal years 1914 and 1913. Of the total of \$6,335,360,451 sea-borne exports in the fiscal year 1919, American vessels carried 25.5 per cent. Of our sea-borne exports in previous fiscal years, American vessels carried 19.0 per cent. in 1918; 14.7 per cent. in 1917; 13.0 per cent. in 1916; 11.8 per cent. in 1915; 8.3 per cent. in 1914; and 9.1 per cent. in 1913.

Caution Against Over Optimism

Are these, however, definitely assured conditions? Some prominent exporters having a deep concern in the permanent strength of our merchant marine have advised caution against an excess of optimism. This, they contend, will only impair further efforts needed to increase our merchant marine. William Harris Douglas, former president of the New York Produce Exchange, speaking for a group of exporters, doubts whether more than 1,500,000 to 2,000,000 tons are good commercial shipping at present, and estimates that even if the full ship program is carried out, the United States will have only enough tonnage to carry 25 to 33 per cent. of our own trade. "I can't emphasize too strongly", Mr. Douglas said, "the fact that there is not the slightest danger of our building too many ships." He points out that other nations will soon be ready to compete with us and build ships, first to carry their own commerce and then to carry as much of United States commerce as they can get.

A different view as to the immediate present is emphasized by the Shipping Board. Its heads recently pointed out in a formal statement to Congress that most of the world's fleets were built before the war and during the first two years of the war. "They have been driven hard, and they are heavily depreciated. Their periods of idleness while undergoing postponed repairs are long, and will become longer—In a short time the mortality among them will be very great. Practically the only ships now free from these handicaps are the ships built by the Emergency Fleet Corporation."

This statement, unless qualified, may tend to an erroneous impression. America's merchant fleets are mostly new but they by no means are the only new ships. Excluding Germany and Austria, from which no returns have been obtained, Lloyd's report shows that in the calendar year 1917 in various countries there were launched 2,937,786 tons of ships (of 100 gross tons or over) as compared with a total of 2,889,718 tons launched in the combined years 1915 and 1916. Of these 2,937,786 tons, 1,162,896 tons came from the United Kingdom, 997,919 from the United States, 148,779 from Holland, and 350,141 from Japan. In the calendar year 1918 there were launched 5,447,444 tons of ships (of 100 gross tons or over) of which 3,033,030 came from the United States, 1,348,120 from the United Kingdom, 230,514 from British Dominions, 489,924 from Japan, and the rest from various countries.

Under construction on June 30, 1919, there were in the world (excluding Germany), merchant vessels totalling 8,017,767 gross tons—3,874,143 gross tons in the United States, 2,524,050 gross tons in the United Kingdom, and 1,619,574 gross tons in other countries.

CHAPTER X

World Demand for Ships

AT THE close of the World War the problem forcibly calling for consideration was whether America could retain its extensive shipbuilding and operating power as a permanent industry. There was the fullest recognition that many of the expedients adopted to germinate new plants were indispensable war measures. By their nature they were temporary and artificial. Under the pressure of war conditions, the cost of our new merchant marine construction per ton was considerably over that prevailing in normal times. The termination of war forced a re-application of normal basic economic principles. These alone, it was clearly seen, could govern the future of our shipbuilding and ship operating. These principles comprehend three vital factors. The first is that of demand. The second, competitive costs of construction. The third is competitive costs of operation.

There is now and will be for some years, as has already been pointed out, a most serious shortage in the world's tonnage. The director of the Norwegian "Veritas" recently declared that it would be difficult to replace the great loss in ships within a reasonable time, for the reason that all shipbuilding countries will first attend to their own more pressing needs. Of the European countries in the war many are disqualified and will likely be for years from engaging in shipbuilding to any large extent. Lacking sufficient raw material, coal, machinery, rails, rolling stock and other necessities, they will also have difficulty replacing the large number of

experienced workmen and seamen killed in the war, and the remaining population is on scanty rations. In Europe labor generally is in a state of unrest. As for neutral European countries, although they have increased their shipyards, their total output has been extremely low compared to needs.

Of the merchant vessels (of 100 gross tons and over) launched in 1918, Lloyd's *Register of Shipping* gives these instructive figures: France produced only 13,715 tons, as compared with a production of 176,095 tons in 1913 and 114,052 tons in 1914. Italy launched in 1918 but a little more than 60,000 tons which exceeded the output of any year since 1905. Holland's launchings in 1918 totalled 74,026 tons as compared with 104,296 tons in 1913, and 118,153 tons in 1914. In 1915 Holland had produced 113,075 tons; in 1916 its output was 180,197 tons; and 1917 a trifle more than 148,000 tons. Norway's production in 1918 was 47,723 tons which was below its annual output for the years immediately before the war. Sweden in 1918 attained an unprecedented record for that country but it amounted to only 39,583 tons. Denmark's production in 1918 was only 26,150 tons, Spain's 17,389 gross tons, and Portugal's 5,311 tons. The figures for Germany and Austria are unavailable.

The world-wide effect of the great lack of ocean-going tonnage is shown in the inability of South America to obtain the full imports needed and to move exports adequately. With not enough ships to convey them, great quantities of foodstuffs and wool have had to remain in storage in Australia and New Zealand. There is also to be considered the factor of emigration and immigration to and from Europe, the one already considerable, the other probably of large prospective dimensions.

Looking to America for Ships

Hence, the demand for ships is large, and will continue to be. This demand resolves itself into two phases—foreign and domestic. Only recently a proposal was made to President Wilson by the French Navy League, representing the chief French Shipping companies and shipbuilders, that French shipowners should be allowed to buy 1,000,000 tons of ships built in Great Britain and 1,000,000 tons of ships built in America, and further that French shipowners be immediately enabled to have 2,000,000 tons of steamers constructed in American shipyards. The only hindrance to American shipyards accepting French orders has been the low exchange rate of the franc. Italy looks to America for ships, and so does Norway. Likewise other European countries. As for the domestic demand, present signs point to a steady yearly increase of American exports. It is estimated that the increase of production in many lines of industry in the United States will of itself compel a rapid expansion of exports. The Webb law passed by Congress allowing combinations to do in foreign trade what they are forbidden to do in the United States, adds much to the prospect of a greatly augmented foreign trade. This law removed the handicap from which American exporters had long suffered.

There is in some quarters a disposition both here and in England to predicate the future size of merchant marines upon the old exclusive lines. This view presupposes that there is an inherent antagonism between the United States and Great Britain, and agitates for what is equivalent to a monopolistic policy, pushed irrespective of the needs or welfare of other peoples. However, it is not the more enlightened and prevailing view. The World War, which brought so

many nations into a brotherhood of arms, has left its aftermath in the desire to promote co-operation, whenever possible, in trade intercourse.

Views on Ships and Trade

"In the new, and let us hope, better world whose reconstruction has begun," says James A. Farrell, President of the United States Steel Corporation and Chairman of the National Foreign Trade Council, "the freedom of the seas, as a working formula of peaceful intercourse, should find a larger conception." In a recent article in the *New York Times*, Charles S. Haight enlarged on the necessity of maintaining amicable relations between the United States and Great Britain and suggested that the two countries should agree upon shipbuilding programs as well as upon trade routes, "so as not to increase the supply of tonnage beyond the proper figure in a helter-skelter scramble for business." Lord Reading, until recently British Ambassador to the United States, declared "there is room for both the increased American and British activities." Mr. E. MacKay Edgar, of the prominent London firm of Sperling & Co., wrote in *Sperling's Journal*, upon his return from America: "Commercial partnerships and understandings between groups of Englishmen and Americans who are engaged in the same lines of business are in my judgment the most fruitful form that an Anglo-American Alliance can take." The advocates of a closer co-operation make full allowance for friendly competition, yet of a kind that will not result in that cut-throat trade warfare so often having disastrous consequences.

Sir Harry Brittain, on his recent visit to New York, pleaded for a close understanding between the United States and the British Empire "first, for their mutual benefit,

and second, because of their great inherent strength for the benefit of mankind. With the future of our two countries naturally depends largely the future of France and our full and firm co-operation could only mean a strong additional safeguard to the great nation on whose soil we have both fought for freedom."

He said further: "That there will be fierce commercial competition between Great Britain and the United States goes without saying, but notwithstanding this there will be countless opportunities for co-operation. America is going out for the world's trade with the heavy weight of American capital and unbounded enterprise. We were world traders when the white men first landed on this continent and have followed that calling with ever-growing intensity in the centuries that have followed up till today, and it is not unthinkable that British experience may be able to collaborate on an even larger scale than has already been the case with the wealth and enterprise of the United States."

Lord Pirrie, head of the great Belfast concern of Harlan & Wolf, and Controller of Merchant Shipbuilding, recently declared that Great Britain and the United States could not get along without each other, and that there was no possibility of an overproduction of tonnage. "It is impossible," he said further, "that during the next ten years we can build too many ships, even though we all build as rapidly as we can. The vast necessity of the reconstruction of the world will absorb all the shipping we can construct. . . . The next five years will be so busy that all America's new shipping, all of the old and new shipping of Great Britain, and all of the additional shipping which both nations can construct will find itself very fully occupied without conducting any wars for trade. There will be no dangerous rivalries." Sir H.

Babington Smith, Commissioner for Great Britain in the United States during the war, believes, on the other hand, that "unless sane and long views are taken and suitable measures concerted it is probable that in three or four years' time the world's shipping will be largely in excess of the world's needs, with disastrous results for shipowners and shipbuilders." But the prevailing view among the bulk of British shipowners is that it will be at least five years before shipping recovers from the effects of the war.

CHAPTER XI

American Shipbuilding as a Permanent Industry

AS TO present and near future orders for American shipyard production, Henry R. Sutphen, Vice President of the Submarine Boat Corporation, says: "Conservatively speaking, there is at least five years work ahead for every well-run American shipyard. The whole world needs ships." At the conference between shipbuilders and the United States Shipping Board Emergency Fleet Corporation in May, 1919, J. H. Rosseter, Director of Operations of the E. F. C., said that he was "enthusiastically committed to the perpetuation of the shipbuilding industry in America." But he added: "We are undoubtedly facing a situation to-day where we have at least a one hundred per cent. excess of shipbuilding capacity in the United States. One of the first things we must do is to correct this condition. If it means the wiping out of yards, it means, in effect, the reimbursement by the Government of the cost of installation as war work and as war cost, but it should not be handed down to the future and the coming generation as an element of cost of what we shall do from this day forward. . . ."

Construction costs were the principal subject discussed by the conference which was attended by 39 representatives of leading American shipbuilding companies. ". . . We are going to recommend the building of ships larger than those built under war conditions," announced Mr. Hurley in explaining the object of calling the conference, "but obviously we cannot appear before the Appropriations Committee and

urge the appropriation of money to construct ships at the high prices which prevailed under war conditions. We must present specific information as to the costs of construction of the new type of ships we will recommend. . . ."

Construction Costs

Before the war the costs per deadweight ton of shipbuilding in Great Britain were averaging about \$50. In the United States the average cost of shipbuilding before we entered the war is stated to have been \$62 per deadweight ton, composed of: Labor, \$26; material, \$24; overhead, \$12. These figures Mr. Rosseter presented at the conference, explaining that they came from a leading authority. In a report of March 1, 1919, Mr. Hurley presented this account of changing costs, due to greatly rising costs of labor, material and overhead:

"I note that 36 tank steamers built on the Atlantic Coast prior to 1917 cost, on the average, \$68.37 per d.w.t., while 12 built in 1918 are reported to have cost \$109.75 d.w.t. I assume that the 1918 deliveries would be influenced by contract prices made perhaps as early as 1916, and would not reflect the cost for ships contracted for in 1918.

"Fifty-four ocean freight vessels constructed in Atlantic ports prior to 1917 cost, on the average, \$65.75 per d.w.t.; 17 built in 1917 cost, on the average, \$81.75 per d.w.t.; while nine delivered in 1918 cost \$138.05 per d.w.t.

"The cost of tank steamers on the Pacific Coast prior to 1917 is reported to have averaged \$64.69; the six tankers built at those ports in 1917 have an average reported cost of \$116.94 per d.w.t.; while an equal number delivered in 1918 are reported to have cost \$138.38 per d.w.t.

"Ocean freight vessels built at Pacific Coast yards have increased from an average cost per d.w.t. of \$115.61, for

deliveries prior to 1917, to \$138.66 for 1917 deliveries, and to \$159.06 for deliveries in 1918."

Construction costs went still higher, as the figures given at the conference showed. Antonio C. Pessano, chairman of the board of directors of the Great Lakes Engineering Works, stated the first contracts be made called for about \$225 a deadweight ton, but that in May, 1919, his company was receiving \$190 a deadweight ton. "We reduced our prices," Mr. Pessano explained, "due to the fact that we had gone on and made improvements and spent our money and learned to do things quickly." C. W. Morse, president of the Groton Iron Works, and director of the Virginia Shipbuilding Corporation estimated that the 9,400 deadweight ton ships that those companies were building would each cost \$1,800,000 or \$1,900,000—probably, he said, not \$225 a ton. M. P. Doullut, president of the Doullut & Williams Shipbuilding Company, at New Orleans, stated that his original contract price for building 9,600 ton steel ships on a lump sum basis was about \$170 a ton, but that because of increasing wages and other prices, the cost had gone up to about \$182 a ton. F. C. Dilke, president of the Carolina Shipbuilding Co., Wilmington, N. C., thought that after the first two ships were completed the company could, because of experience gained "get our costs well below \$200 per deadweight ton." A number of other shipbuilders pointed out that because of increased costs, their charges varies from \$202 to \$250 a deadweight ton, according to the type of ships.

On the other hand, costs in certain large plants decidedly decreased. This was shown when in April, 1919, the Submarine Boat Corporation made an offer to the United States Shipping Board to build 12,000 ton steel oil-burning freighters at a flat price of \$149 a deadweight ton—a large drop from

the \$185 to \$225 per ton estimates which had prevailed for ships of this type. The company's officials explained that they were able to reduce costs because of standardization of design and quantity of fabricated output.

That the United States, by reason of its success in the standardization and fabrication of ships, could advantageously compete with the rest of the world after the war, was the opinion expressed previously by Harris D. H. Connick, vice-president of the American International Corporation and of the American International Shipbuilding Corporation, at a hearing before the United States Senate Committee on Commerce. "Standardization," he added, "is doing the same thing for ships that has been done for sewing machines, locomotives, automobiles, watches and other such products."

Efficiency of American Plants

A striking fact brought out at the conference was that America now has an actual, not merely a potential large force of experienced shipbuilders of high efficiency. Of the force in the yards of the Downey Shipbuilding Corporation, Mr. Downey said: "Seventy-eight per cent. of our men were greenhorn men in shipyards . . . and they got up to an efficiency superior to anything I have seen in a shipyard in old days with regular shipyard mechanics." "We know," said Mr. Evans, president of the Baltimore Dry Dock and Shipbuilding Company, "that our men are learning. We are getting a splendid spirit in our yard, and if I were assured of work for two years I believe we could go it along with the foreigners. I don't believe we can build ships as cheaply as they can; there will be enough demand for ships to keep them busy and still give us something. . . ." Mr. Pessano agreed with Mr. Evans. Mr. Morse's opinion was: "If you will make a con-

tract and let the American Bureau or British Lloyd's vise the work and everything that is done in the ships, allow money enough in progress payments to discount the bills, so that they can buy in the cheapest market, American shipbuilders can compete with any place in the world. We can in our yard, I do not hesitate to say, but if you are going to have eight or ten inspectors who keep changing the ship specifications every day they come along, you cannot get the lowest cost. . . ."

The same opinion was that of Robert Haig, vice-president of the Sun Shipbuilding Company, Chester, Pa., who was trained in British shipyards. "The American shipbuilder's cost," he said, "is going to come down because his efficiency is improving, and if you can reduce this interference with the contract after it is let . . . then you are going to get very much increased efficiency in the cost of the ship. . . . The American shipbuilder turns out a much finer cargo boat than the British shipbuilder turns out. . . . They turn out special ships, special work that we don't touch, probably, but comparing the cargo boat or the passenger boat today built in England, and the same type of boat built in this country, this country's ship is the better. . . ."

Advised Effacing Mushroom Yards

Concluding the discussion on costs, Mr. Rosseter pointed out that as an operating shipper it was clear to him that successful operation demanded ships that could be kept going to advantage in hard times. The situation in England due to the disturbed conditions in labor circles and the increasing cost of coal had increased the cost of train operations, manufacturing and living, all of which had had a very serious effect on British shipping inasmuch as it produced higher costs for their propelling power and British ships depended basic-

ally upon coal. These factors, Mr. Rosseter said, placed the United States in an advantageous position. "We now have an opportunity that probably never before has come to a nation really to perpetuate this industry of shipbuilding. . . . No matter what the cost of building in England is, . . . we can match it in two ways. . . . We have twice as many plants as we need, and we must cut them 50 per cent. . . ." This, Mr. Rosseter said, would fall on the inefficient and on Government enterprises of shipbuilding and also on the Great Lakes plants which, because of canal limitations, could not build the large ships needed.

"Modern operation," said Mr. Rosseter, "requires an entirely different type of ship from what we have had in the past, and a large measure of that difference is in the size. We now have plans for a 15,000 ton ship that can be manned for practically the same cost as our 8,000 ton ship, and at an extra cost of a portion of a decimal. When we entered into this important problem of building up our foreign trade, the bulk of which will rest on space articles like coal, in which commodity we are going to get a share of the world's trade in competition with Great Britain, we must have a ship that will deliver, as it does on the Lakes, a ton of coal a thousand miles as cheap or cheaper than any other nation can."

At this point H. S. Wilkinson, president of the Toledo Shipbuilding Company, expressed a few words of caution against the building of too many large ships until there were adequate harbor and terminal facilities to handle them. When on the Great Lakes, Mr. Wilkinson said, 4,000-ton ships were supplanted by 12,000 and 15,000-ton ships, it was 12 years before the large ships could be handled successfully. Mr. Wilkinson pointed out that 80 per cent. of the world's vessels was under 5,000 tons, and that large vessels were

unadaptable for harbors where water was shallow and where it would take 25 years to deepen it.

The second way of matching England's competition, Mr. Rosseter said, was to abolish the "cost-plus" system which encouraged extravagance in costs and led to a superfluity of employes.

In advising the effacement of half of our shipbuilding plants, Mr. Rosseter had in mind the serious disadvantage in overhead expenses caused by too extended a capitalization, as compared with the British shipyards which through decades have been slowly built up, with the capital cost being either written off or reduced to insignificant proportions. Recently *Lloyd's List*, a British shipping journal, brought forward this same criticism of American shipping, declaring that the entry of many new shipbuilding companies had brought overcapitalization. The result, it said, would be that all could not earn reasonable dividends; that in many cases there would have to be readjustments of stock; and that in other cases there would be a restriction of activities if not actual stoppage of operations.

Pacific Coast Conditions

What, it may now be inquired, is the status of the Pacific Coast shipyards? With the view of having freight rates on steel and other essentials from Eastern United States to the Pacific reduced to a basis that would allow them to compete with Eastern and Oriental yards, Pacific Coast shipbuilders recently organized the Pacific Coast Shipbuilders Traffic Association. L. R. Bishop, Chairman of this Association, has declared: "We have been and are now inaugurating economies in our yards wherever consistent, and tending to bring us up to the standard of efficiency and its resultant reduction

costs which will help us meet this world-wide competition, but the most serious handicap we find ourselves facing is that of high freight rates, which places us at a very decided disadvantage with our competitors."

Comparative Costs of American and British Construction

According to a statement made at Lloyd's, the cost of shipbuilding in Great Britain in July, 1919, was \$150 to \$170 a ton—the general rate \$150 a ton. The great increase over the \$50 rate obtaining before the war was attributed to heavy taxation, to supply and demand, to higher prices for material, and most of all to the increased cost of labor. Comparing these British costs with the average of \$180 a ton for contracts then being placed in the United States, Lloyd's found that the cost in Great Britain was only a little cheaper than in the United States. Before the war, British ship builders worked 54 hours a week; now they are on a 44-hour schedule and are getting from three to four times higher wages. Practically, however, many of the men in the yards consent to work only three or four days a week, voluntarily laying off the rest of the time.

An official of the American Bureau of Shipping states that private contracts for steel freighters were being given out to Eastern American shipyards, in the fall of 1919, at an average of \$170 a ton, and contracts for tankers at about \$200 a ton. In England the same class of steel freighters at the same time were contracted for at from \$145 to \$150 a ton and upward, but with open clauses for increases in labor and material costs, and in general without definite dates for delivery.

British Comment on Our Shipyards

Lord Pirrie declares that wages in Britain will never go back to their old level. But he points out that confronted by the British worker's slogan of "more pay for less work", the British shipbuilder "is called upon to meet the American condition of greater pay and greater production." J. W. Isherwood, a British authority on ship construction, said after a visit to the United States: "The American shipyard workers make higher wages than the men in our yards do. But they produce ships quicker and cheaper. The reason is that high wages are based upon a high level of production and efficiency, which is an immense economic factor, while our shipbuilders . . . are stultified by labor insisting upon a minimum of output and a maximum of payment. Those who predict that America will not win in the race for turning out the tonnage that will be required because she is paying higher wages, are in my opinion, mistaken. Those higher wages are being paid on a basis of results, not only in ordinary manual labor, but in the handling of labor-saving devices, and in this respect higher wages will mean cheapness."

In the Liverpool *Journal of Commerce*, November 15, 1919, there was published a further resumé of Mr. Isherwood's impressions as compared with those of Lord Pirrie. This resumé thus described Mr. Isherwood's opinions of the newer American yards: "He tells us that they have been most carefully laid out for rapid and economical ship construction, and he adds that many of the yards have achieved a rate of production much in advance of our own, and at a cost at which he frankly says he is astonished. He lays stress on several points which our workers would do well to take to heart. One is the broader view which is taken by unions of the scope of a man's job, and that capacity is the real test of the worker.

One result has been a considerable speeding up of output, and another is that the workmen earn high wages, which are not reflected in an increased cost of labor when judged by the standard of output.

"Mr. Isherwood will not have it that this speeding up of production has resulted in inferior work in American yards. The quality of the ships is quite up to the standard set by British yards. The point on which emphasis is laid by Mr. Isherwood is that American building costs are not so appreciably higher than those which obtain in this country as to put us on safe ground. . . .

"On the other hand, Lord Pirrie thinks we ought not to be perturbed at the increase in the American output, but that for some years to come we should welcome the aid given by American yards in producing the tonnage necessary for the reconstruction of the world's industries. This great shipbuilding magnate thinks that America will merely take the place which has been vacated by Germany, but with this difference, that we shall be dealing with a competitor who will fight fairly, and not hit below the belt. Lord Pirrie does not agree that in the matter of price the American can compete with the British shipbuilder, or indeed that American shipping, backed by a home shipbuilding industry, is likely to be established on the scale which some people believe."

Mr. Isherwood, Sir Frederick Henderson, former president of the Shipbuilding Employers' Federation, and James French of Lloyd's *Register of Shipping* point out that the attitude of the British worker is hostile to labor-saving devices, and when they are introduced, difficult to get the working force to co-operate. "It is becoming increasingly difficult for Great Britain to meet American competition," Mr. French thinks. "Present shipbuilding costs are not far from the American

level and labor conditions are far from encouraging any belief in a reduction of costs in the near future."

It was estimated in November, 1919, that there was a differential in the cost of tonnage of only 10 to 12 per cent. in favor of the British shipbuilder, and that this difference was diminishing.

Increased British Costs

The enormously reduced output of coal in England has been a large factor in enhancing the cost of steel.

After personally making a survey of conditions in England, David S. Kennedy wrote in *The Marine News*, issue of November, 1919, that: "Coal which cost eleven shillings a ton in 1913 now costs twenty-nine shillings, and there is a widespread fear that recent developments will further increase this price by six shillings.

"In 1913 the output of coal amounted to 287,000,000 tons, or 259 tons per person engaged in the industry. It is estimated that for the fiscal year 1920 the output will be 192,000,000 tons, or 180 tons per workman. This radical reduction in both actual and relative production has not only cut down the exportable surplus almost to the point of extinction, but has raised the cost of operation of the steel industry to a figure which has seriously compromised their ability to maintain themselves against foreign competition." But since this was written reports have indicated an increase in British coal production.

Sir Auckland Geddes, speaking in the House of Commons (July, 1919), said that steel plates for shipbuilding were \$87.50 a ton in England as against \$70 a ton in the United States. Lord Inchcape, head of the Peninsular & Oriental line, Sir Joseph Maclay, A. Munro Sutherland and some other British

shipping men think, however, that the British shipping industry will be able to meet all demands if steady work in the yards and relief from taxation can be obtained. The present tendency among British shipbuilders is to amalgamate. About five or six large groups now control the principal shipyards formerly owned by about 20 different concerns. Recently Lord Inchcape arranged to take from the British Government fabricated ships and apportion them among the British lines needing them. British ships of 1918 construction were sold at an average of about \$136.50 (estimated on the normal exchange basis of the pound). Of the ships under construction in Britain, in 1919, Lord Inchcape had allocated, up to August 1, 1919, a total of 153 steamships of 1,056,821 gross tons for £22,887,400—an average of \$115 a gross ton. In contrast with the sale by the U. S. Shipping Board of steel ships at from \$200 to \$225 a ton, the advantage is obviously and greatly with the British shipowner. But inasmuch as Congress has not fixed any policy, criticism of the U. S. Shipping Board, shipping men say, would not be fair.

British Construction Increasing

The depreciative utterances of some of the British shipping authorities on British shipyard production should not, however, be construed as meaning that British ship output has decreased.

Lloyd's reports that on June 30, 1918, there were 392 merchant vessels (of more than 100 gross tons) of a total of 1,815,013 gross tonnage under construction in the United Kingdom. On June 30, 1919, there were under construction in the United Kingdom 782 merchant vessels (of more than 100 gross tons) totalling 2,524,050 gross tons. About 709,000 tons more were being built on June 30, 1919, than were under

construction a year before. While launchings from American shipyards have recently been declining as compared with the maximum figure of 482,638 gross tons in the month of May, 1919, the production of British shipyards (United Kingdom) in the calendar year 1919 was 272,422 tons more than in 1918, although nearly 16 per cent. below the figure for the record year 1913. A statement by Lloyd's, cabled from London, January 28, 1920, stated that vessels launched in the United States in the calendar year 1919—4,075,385 tons—equalled 57 per cent. of the world's output.

Officials of older American shipbuilding yards, however, assert that what they regard as temporary conditions are not to be accepted as a permanent indication of the ability of our yards to compete with foreign plants. This is the view of F. P. Palen, of the Newport News Shipbuilding and Dry Dock Company, who says that (early in 1920) wages in British shipyards were only about 50 per cent. of the wages paid to American shipworkers, and that British costs were about 25 per cent. less than American. H. Birchard Taylor, vice-president of the William Cramp & Sons Ship & Engine Building Company, similarly views the future, and says: "It is true that the costs of raw materials entering into shipbuilding in England have been higher than those in this country but these costs in England are already decreasing, and it may be confidently predicted that this difference favoring American yards will soon be so reduced as to become an unimportant factor." Economies by labor-saving devices, used to a greater extent in American than in British yards, are, in Mr. Taylor's opinion, not sufficient to overcome the very abnormal wage scale paid here and other handicaps. "Another factor" he said, "of great importance now greatly favoring foreign shipyards, is the high rate of exchange."

J. W. Powell, vice-president of the Bethlehem Shipbuilding Corporation, Ltd., says: "A number of facts can be adduced to show that American yards are far from being able to compete with Great Britain in the cost of merchant vessel construction. The United Fruit Company recently contracted with British shipyards for more than a dozen vessels. In a period of more than a year only about a dozen vessels have been sold to foreign purchasers by all American yards. . . . A recent tanker price offered to an American oil company by a large British shipbuilder maintains the same difference under our company's prices as that which prevailed before the war." Mr. Powell says that the statement of one of the larger British shipyards, in September, 1919, showed that the hourly earnings in the American shipbuilding trades exceeded those in the corresponding British shipbuilding trades by percentages varying from 122 to 144. "The present American scale is between 140 and 150 per cent. higher than before the war." Further Mr. Powell says that "the labor cost on an American cargo ship built under to-day's conditions is approximately \$65 per ton. The corresponding labor cost in a British yard would be something under \$30 per ton, a difference of about \$35 per ton in favor of the British built ship. Overhead costs in the United States just about counterbalance the advantage in American shipbuilding material costs, leaving the net handicap to American shipbuilding roughly as the difference in wage costs. . . ."

Large Private Production In U. S. Yards

After the World War apprehension was often expressed that shipbuilding in the United States might shrink to the low production of pre-war years. That this fear had no foun-

dation is shown by the production figures given in a statement issued on December 1, 1919, by the Atlantic Coast Shipbuilders' Association. The statement declared that "independent of whether the Government continues its ship building program or not, America's new shipbuilding industry is already beginning to prove that it is here to stay." The statement continued:

"Despite the handicaps of labor difficulties, high costs, official restrictions and wholesale suspensions and cancellations of governmental contracts, the shipyards are to-day in a stronger position than ever before. Irrespective of construction for Government account, they are establishing foundations for the future that insure the new American merchant marine an adequate and efficient source of supply of shipping wherewith to maintain the expansion of the United States in the trade of the world.

"Although only a few months have elapsed since American shipyards became free to accept orders for private account, there are already on the ways and under rapid construction more than 550,000 gross tons of merchant shipping. This amount is exclusive of all Government work. And, furthermore, it includes no wooden steamers and no sailing vessels of any kind, being confined to steel steamers, the prime essential for foreign trade.

"With the addition of contracts placed, but upon which work has not been begun, it is probable that the shipyards of the country have in hand orders for not far from a million gross tons of oceangoing vessels.

"These figures of ships building and to be built are unmistakable evidence of the belief of business in the efficiency of American shipyards and of confidence in the future of the American merchant marine. The confidence of the shipbuild-

ing industry itself is shown by the fact that in a number of cases the yards have taken over ships upon which the Government had cancelled contracts and will complete them with a view to meeting the growing demand for merchant tonnage."

Of the 118 vessels of about 550,000 gross tons under construction for private interests in American shipyards on December 1, 1919, only one was being built for foreign account. Because of the Government's consent not being given until a fairly recent date, American shipyards were long withheld from bidding for foreign orders. Of the 550,000 gross tons of steel steamers covered in the foregoing statement, only 36,000 tons were being built in the Pacific Coast and Great Lakes shipyards. The remainder, more than 93 per cent., were under construction in Atlantic Coast and Gulf shipyards. Most of these ships are freighters and tankers.

The constant increase of orders for private construction in American shipyards was shown in a supplementary statement issued by the Atlantic Coast Shipbuilders' Association on December 24, 1919. This statement said: "The total now under construction, [in the whole of the United States] exclusive of all Government work, is 805,000 gross tons, the equivalent of more than 1,200,000 deadweight tons, of sea-going vessels. . . . Additional contracts which have been placed, but upon which operations have not been begun, will bring the total to more than a million gross tons." Of these 805,000 gross tons of vessels then under construction, 400,556 gross tons were freighters; 369,084 gross tons were tankers; and 35,507 gross tons were other types of sea-going ships.

CHAPTER XII

Operating Costs—Labor Factors

IN ADDITION to production costs the maintenance of our merchant marine depends upon operating costs. These may be said to cover six main factors. They are: (1) Type of vessel used; (2) Bunkers and stores; (3) Wages and sustenance of officers and men; (4) Insurance of hull and machinery; (5) Maintenance and repairs; (6) Port charges, fees, etc.

Labor costs of officers and men are varyingly estimated at from six and seven to ten per cent. of the total costs of operation; Mr. Hurley computed them at 10 per cent. Homer L. Ferguson, president of the Newport News Shipbuilding and Dry Dock Company, estimated (April, 1919), that wages of seamen constituted probably from 7 to 12 per cent. of the costs of operation. But labor costs as well as other costs are partly conditioned upon the type of vessel used. In actual wages, the European standard was formerly much below the American, while at the same time the crew's food and supplies on American vessels have been of a better quality than on most foreign vessels. These higher subsistence costs on American vessels were caused partly by stricter laws and in part by the aim to attract efficient men. During the war, however, wages on European vessels generally rose to the American standard.

"As far as the larger maritime nations are concerned, vessels touching at New York in December, 1918 were, with very few exceptions, in one way or another paying the American wage scale," says the 1919 Report of the Director of the Marine and Dock Industrial Relations Division, United

States Shipping Board. "The wages of American sailors had since 1914 gone up about 150 per cent., and American firemen's wages approximately 90 per cent.; but foreign wages had risen a much larger per cent. and are now equal to the American rates." By the taking away of the war bonus in December, 1918, the wages of American seamen were reduced.

The Crew's Wages

When he returned from his European mission early in 1919 Mr. Hurley stated that American seamen were getting \$75 a month, and British seamen \$72 a month. Mr. Ferguson gave the same figures. British seamen's wages were, it is true, increased by a war bonus, but this, it has been reported, is to be made a permanent addition to wages. Mr. Hurley reported that the French and Dutch were paying higher wages to their merchant crews, and that in Sweden the seamen's wage scale was even higher than in the United States, but he did not give the figures. He did not think that the lower wages paid by Greece, with its comparatively small merchant marine, were of importance as affecting the policies of America's and Great Britain's powerful merchant marines. In general, the conclusions of Mr. Hurley's survey are confirmed by statements made at Lloyd's. This agency says that the tendency on the part of the shipping of various countries is towards a standardization of wages. The commission on international labor legislation appointed by the Peace Commission at Paris is reported to have approved of the principle of uniformity of seamen's wages. If this becomes a fact it removes one marked disadvantage in point of costs which the American merchant marine has suffered. But it is not yet a fact.

Following a strike of seamen, firemen and others of ship crews, a new schedule of wages was agreed upon on July 28,

1919, by the American Steamship Association, the United States Shipping Board, and the various labor organizations concerned. This agreement, effective for a year, applies to the trans-Atlantic, Atlantic and Gulf coasts and has been adopted on the Pacific coast.

Wages of able seamen were increased from \$75 to \$85 a month, and ten per cent. increase was also allowed ordinary seamen, carpenters, carpenter's mates, boatswains, quartermasters and boys. Firemen formerly received \$75 a month; under the new agreement their pay was increased to \$90 a month. Deck engineers, oilers, pumpmen, donkey men, coal passers and water tenders obtained a wage increase of 10 per cent. The electrician and refrigerating force obtained a wage increase of \$15 a month. The chief stewards on freight ships received an increase of \$15 a month, and those on passenger ships 20 per cent. a month. Chief cooks on freight ships obtained a wage increase of \$15 a month, and those on passenger ships an increase of 15 per cent. Chief bakers obtained an increase of 15 per cent., and mess boys and waiters and stewardesses an increase of \$5 a month. The pay of all officers was increased about 10 per cent.

The American Steamship Association claims that these wage increases augment the differential against the labor costs of our merchant marine. Since this wage agreement was made, however, there has developed on British ships somewhat of a tendency to demand an equality with the new American schedule of wages.

There is also another significant tendency. This is the policy of each nation to do away with cheap Eastern labor and employ men of its own nationality on its merchant marine. In recent years higher labor costs, especially on the Pacific, have been much increased by the Seamen's Act of

March 4, 1915. This required certain fixed proportions of able seamen, and provided a language test for 75 per cent. of the crew. It was specifically aimed at Chinese and Japanese sailors, and had the effect of causing the Pacific Mail Steamship Company to discontinue its trans-Pacific operations. If Great Britain and other nations discard more and more of Asiatic labor, American shipping is placed on a better competitive footing.

Increase of American Seamen

Ninety per cent. of the officers on American vessels are now Americans, mostly native born, and the work of the Merchant Marine Training Schools has brought into our merchant marine a steadily increasing number of born Americans. Most of them are under 25 years of age, and take up sea service with the expectation of making it their life work.

The increase of American seamen is shown by a comparison of the number in our merchant marine in 1914 and 1919. The Bureau of Navigation of the Department of Commerce reports: On June 30, 1914, there was a total of officers and crew on American merchant vessels of 199,584 of whom 63,247 were born Americans and 31,417 were naturalized Americans. On June 30, 1919, the officers and crew on our merchant marine totalled 255,922 of whom 97,160 were born Americans, and 24,676 naturalized Americans. The per cent. of Americans in 1919—47.6—was substantially the same as in 1914, but whereas in 1914 native born Americans comprised two-thirds of this percentage, they comprised four-fifths of it in 1919.

This change the Bureau of Navigation says has been due in part to young Americans discharged from the Navy who entered the merchant marine; to those in draft service who

preferred merchant marine service to the Army; and to the appropriation by Congress of \$6,250,000 to the U. S. Shipping Board for the recruiting and training of officers, engineers, and crews for American vessels.

Further to improve the efficiency of our merchant marine officers, New York underwriters have been urging the establishment of a register of captains similiar to that kept at Lloyd's in London, so that underwriters will be able to ascertain at once the record of any officer who may be appointed to command a steamer.

CHAPTER XIII

The Oil-Burning Ship

BUT WAGES are now only one aspect of labor costs. A great revolution in the operation of seagoing ships has recently taken place, and this carries with it the alteration of other and even more important costs than wages. This new factor is the advent of the oil-burning vessel. On some points of ship operation costs, such as port charges, there is no reliable way of getting comparative data; some shipowners have their own piers, others have to rent piers. But a fair volume of comparative data as to the savings made by the oil-burning vessel over the coal-burning vessel already exists, and points to certain noteworthy results.

A statement given out by the Information Bureau of the U. S. Shipping Board, based upon information given by the Division of Operations, enumerates these distinct advantages: A ton of oil used in a Diesel internal combustion engine will give six times the power given by a ton of coal with turbine or reciprocating engines. A ton of oil used in oil-burning boilers of turbine or reciprocating engines will give twice the power of a ton of coal used with the same types of engines. The cost of oil by the use of the Diesel engine on the Atlantic is less than one-third that of other oil-burning boilers and reciprocating engines. On the Pacific where oil is cheaper and coal dearer, the difference is proportionate. By the use of oil, engine room crews are reduced and cargo space increased. The reduction of the engine crew means lower labor costs and improved competitive ability with nations of lower standards.

"The figures over coal of 1,340 tons or equivalent to a case of a 10,000 per voyage, and a saving of 540 tons by her to a voyage over oil-burning installation equivalent to 7,000 per voyage."

in connection with there was, at first, a disposition to be skeptical require 800 tons of sties claims made for the oil-burning vessels. case of Diesel engine, *The Engineer*, of London, said in an edition of May 31, 1919, that although oil had been extensively used for naval vessels, yet the merchant vessel problem can be compared to a different problem. The navy needs, it said, were of this 7 per cent of cost, while in the case of a merchant vessel,

These results were the final criterion. "One must allow a larger allowance," *The Engineer* further, "that the progress of the per cargo ton has been disappointingly slow. This is partly due to analysis published in the way of producing large saving and steam to the exacting requirements of a marine engine. Thus, for an engine so partly due to the much higher cost compared cargo between machinery, which to a greater or lesser extent, of fuel as figures the fuel economy. . . ."

84 cents for coal
oil fuel would *ring Oil*

of the total cost. A month later, *The Engineer* (February 21, 1920) published this article: "Some interesting comparisons between coal and oil as fuels for steam raising were made in a

But the letter before the Birmingham Association of Mechanical Engineers, February 8. The points in favor of oil in place of coal for ships are: (1) Radius of action increased by 25 per cent. on equal bunker weight, or 80 per cent. on equal weight of fuel; (2) up to 83 per cent. thermal efficiency increase; (3) boilers can be forced up to 50 per cent. thermal rating; (4) control of smoke; entire absence of smoke screen as desired; (5) reduction of

labor by about 70 per cent.; (6) constructional advantages; (7) bunkering at sea. There are many equally attractive advantages in the application of oil to the mercantile marine. . . . Efficiency as high as 84.5 per cent. has been obtained in this country on Scotch marine boilers using Mexican fuel with the pressure system of oil burning."

The British navy early developed the use of oil as fuel. But it was not until very recently that the principal British passenger steamship companies decided to build oil-burning ships or generally convert coal burners into oil burners. This decision was based not only on the proved superiority of oil but on the expectation of forthcoming competition from German passenger steamship lines which unquestionably would run their ships on an oil-fuel basis.

In fact, the use of oil as fuel is now occupying the intense attention of the leading shipping concerns of various European and Asiatic countries.

American Oil-Burning Vessels

Meanwhile, as regards oil-burning ships, the United States is far in the lead. To a great extent oil has supplanted coal in the new American merchant marine. The United States Shipping Board has announced that four-fifths of the new steel ship tonnage are oil-burning vessels and one-fifth coal-burning. These vessels include the ships already delivered to the Shipping Board and those now being constructed, or provided for that body. Of the 1,706 steel ships, comprising a deadweight tonnage of 11,547,386, approximately 79 per cent., 9,065,978 tons, will be propelled by oil. The state of completion of the Government's fleet of steel vessels, as of June 30, 1919, classified by the type of fuel used, is shown in the table on opposite page:

	<i>Oil Burning</i>	<i>Coal Burning</i>	<i>Total</i>
COMPLETED:			
Number of Vessels . .	364	406	770
Total Deadweight . .	3,000,456	1,855,008	4,855,464
UNDER CONSTRUCTION:			
Number of Vessels . .	552	78	630
Total Deadweight . .	4,084,872	344,600	4,429,472
NOT YET LAID DOWN:			
Number of Vessels . .	272	34	306
Total Deadweight . .	1,880,650	281,800	2,162,450
GRAND TOTAL:			
Number of Vessels . .	1,188	518	1,706
Total Deadweight . .	8,965,978	2,481,408	11,447,386

These figures do not include 12 tankers under construction for the Navy.

The foregoing table, issued by one bureau of the United States Shipping Board, agrees in respect to some of the figures given in the table of vessels and tonnage prepared by another bureau of the Shipping Board, the Division of Planning and Statistics, the figures of which are incorporated in Chapter IX. In both tables 770 is given as the number of vessels completed by July 1, 1919, and it can be assumed that the proportion of coal-burning and oil-burning vessels is correctly stated. Some of the other figures in the above table are at variance with those in the table of the Division of Planning and Statistics as, for instance, the number of vessels not laid down and their tonnage as well as the grand total of tonnage. But these variations do not seriously affect the approximate statement of coal-burning and oil-burning vessels. The table of the Division of Planning and Statistics gives 1,727 as the total number of steel vessels under contract and commandeered construction in the United States, Japan

and China, including 15 purchased steel vessels. Deducting the purchased steel vessels and one steel schooner and five barges, this leaves 1,706 vessels which agrees with the above grand total, of which 1,188 are oil-burning vessels.

Speed and Economies

Examples of the actual operation of American oil-burning ocean vessels are shown by achievements in 1918 and 1919. The *Mount Hood*, of 4,600 deadweight tons, built at Portland, Ore., burned approximately 1,600 barrels of oil to make a voyage of 7,900 miles from San Francisco to Chile and back to Mobile, and carried a total crew of only 28 men. The average oil consumption of the *Mount Hood* was 0.2 barrels or 8.4 gallons per mile, and she carried 3,800 tons of cargo on the voyage south and brought back 4,100 tons of cargo. It is therefore estimated that the *Mount Hood* burned 0.0021 gallons of oil per cargo-ton mile. Estimating this at the prevailing market value of oil, the average fuel cost of the trip was \$0.01155 per 100 ton miles.

By installing oil-burning engines on the *San Juan* and the *Ponce* of the New York & Porto Rico Line, their steaming radius has been increased to 6,000 miles, an addition of 2,500 miles over their former steaming radius. These ships can therefore take on oil at New York, go to Porto Rico, return and make half of a second voyage without renewal of oil supply. When using coal the *San Juan* had a speed of 10½ knots; under oil it was easy to make 12 knots. The removal of the *San Juan's* coal bunkers added 500 tons to deadweight capacity or 25 per cent. to the cubic cargo capacity, increased passenger space, and the use of oil engines reduced the engine crew from 78 men needed when coal was used to 68 men. The *Sagaporack*, a 7,500 deadweight ton cargo boat, run by oil-fired furnaces, one of a num-

ber of the same type of ships built at Hog Island, carries only 38 men, which is no larger crew than is carried on a 3,500 deadweight ton coal-burning ship built on the Great Lakes; only two men are required in the boiler room and two in the engine room. These are a few characteristic examples of the economies already effected by the use of oil as fuel. The 12,000 ton steel cargo oil-burning ships which the Submarine Boat Corporation recently offered to build at \$149 a ton were designed to have a steaming radius of 13,000 knots without refueling.

Results on a Large Scale

Of more significance than the performance of particular vessels are the results noted from the practical operation of a large number of oil-burning vessels. The Division of Operations of the United States Shipping Board stated, September 11, 1919, as to these returns in reports: "These logs indicate that a rate of 1.25 barrels of oil per I.H.P. [indicated horsepower] hour fairly represents the results obtained in actual practice on [turbine or reciprocating] steamers. On motor ships [Diesel engine] a rate of 0.5 barrels per I.H.P. was used.

"Engineers 'logs,' " the report of the Division of Operations continued, "were also employed to determine the fuel consumption in port. This was found to vary through a wide range even for ships of very nearly equal tonnages. An average was established, however, which varies with the vessel tonnage and which gives values from 28 barrels a day for a 5,000 deadweight ton ship to 62 barrels per day for a 12,000 deadweight ton ship."

The Division of Operations calculates that beginning with the year 1921 nearly 60,000,000 barrels of oil a year will be needed for the ships now operated by the United States

Shipping Board, excluding any private construction done after August 1, 1919.

The use of fuel oil on big speedy passenger liners is regarded as certain to make a powerful appeal to oversea travelers. "If the United States Government", P. A. S. Franklin, president of the International Mercantile Marine Company, was quoted as saying in an interview cabled from London, August 10, 1919, "builds four thirty-knot liners for the Atlantic trade, the \$8 a mile mail subsidy, passenger fares and express parcels will pay for the operating expenses. It is a strange thing that passengers in a smoking room always talk of the fastest trip they have made and are willing to pay high rates for speed." Experienced ship operators believe that the building by the Government of big ships will be worth their cost in prestige alone.

CHAPTER XIV

Further Principles of Operation

THE TYPE of vessel is a matter of the highest importance in present maritime operation. Exporters favor the providing of an adequacy of large ships. Exception is made in the case of the West India or other trade for which a reasonable number of 5,000 ton steamers will suffice. Shipping Board officials have recently been alive to these needs. At the shipbuilders' conference, Mr. Rosseter said that the United States had too few ships of more than 10,000 tons. "Whatever it was," he said, "that started companies in Great Britain to building large, fast ships, led in the proper direction, and they were very wise in doing it. As an operating man, I can tell you that the difference between a moderate-size slow ship and a large-size fast ship is the difference between success and failure."

This, of course, does not mean the ignoring of other and most necessary types of vessels. The need of a well-balanced fleet is stressed by P. A. S. Franklin and other leading shipping men. This fleet, they urge, should consist of big fast ships, intermediate ships and freighters. The "tramp" ship, for example, is considered indispensable. It was estimated that, before the war, fully two-thirds of the world's tonnage used in ocean traffic comprised "tramp" steamers. Of this whole number Great Britain was said to own about 70 per cent.

The Service of Tramp Ships

It is the "tramp" ships that carry the low-grade freight and bulk goods—the coal, grain ore, fruit, timber, cotton,

nitrate and other such commodities. The cheap and bulky character of most American exports call for low freight rates. These are largely provided by the "tramp" steamers which take cargoes for whatever destination is chosen, and after delivery of one cargo, by often going to whatever other port a return cargo can be picked up, avoid the ruinous expense of a long trip in ballast. Several years ago the National Foreign Trade Council pointed out: "An American merchant marine sufficiently large to relieve, say, 60 per cent. of our bulky exports and imports from dependence on foreign shipping must obey this economic necessity as completely as the European and other shipping now carrying the greater part of this trade . . ."

Moreover, inasmuch as the average harbor capacity throughout the world is sufficient to accommodate vessels of about 8,000 deadweight tons, the "tramp" ship can ply practically anywhere. This is not so of the very big ships for the accommodation of which there are only a few selected harbors. If our merchant fleet was composed largely or mainly of big ships, they could go only to a limited number of harbors, unless various countries completely altered their harbors, to do which some countries have recently manifested an unwillingness. For trade service on a number of routes the best cargo ship is a vessel of between 8,000 and 10,000 tons.

An adequacy of tankers is also urgently needed to balance our merchant marine. The United States already has a considerable number of tankers, but with the fast growing use of oil as fuel on ships and for other propelling purposes and with the pressing and increasing demand for oil from all parts of the world, many more tankers are needed. Testifying before the House Merchant Marine Committee, on

October 22, 1919, John Barton Payne, who succeeded Mr. Hurley as Chairman of the U. S. Shipping Board, stated that approximately 1,000,000 deadweight tons of ships, including a fleet of tankers and many 10,000 ton cargo vessels, should be constructed in order to balance the American merchant marine.

Such a well-balanced fleet will also prove a powerful stimulus to the merchant marine personnel by holding out opportunities to rise from the lowest grade to the position of captain of the biggest ship. This is the view of shipping men.

Return Cargoes and Fuel Depots

A vital need applying to all classes of cargo ships is that of providing for return cargoes. An empty ship is a costly ship. This established principle was strongly emphasized when, in 1916, British shipping interests appointed a committee to formulate plans for the future. The very first point brought out by the 1917 report of this committee (representing the Chamber of Shipping of the United Kingdom and the Liverpool Steamship Owners' Association) was this: That the prosperity of Great Britain's foreign trade had been largely due to the fact that it had been able to export a bulky article such as coal against its big imports of food and raw material, thereby filling its ships both ways and keeping down the freight costs. American exporters declare that one of the worst handicaps of our merchant marine heretofore has been in not securing return cargoes from foreign markets. Other nations built up a foreign trade while America lacked the ships. Exporters recently recommended that the United States Shipping Board make a careful study of what is essentially a complicated question, and that everything possible be done to change these conditions.

The establishment of coal and oil depots at foreign ports for American ships is pointed out as another need. The British committee above referred to made this recommendation in 1917 as to British ships. It proposed that coaling and oil stations should be encouraged and developed throughout the British Empire, so that the supplies might, as far as possible, be under British control, although without restrictions on foreign shipping. American shipping men and exporters saw the pressing need of doing the same for the American merchant marine, particularly on the great ocean trading routes, so that American ships can obtain supplies at the lowest possible cost.

The U. S. Shipping Board has announced that the new fuel oil station, with a capacity of 110,000 barrels, which was under construction at St. Thomas, Virgin Islands, has been opened to supply American ships plying between the United States and South America.

A similar station is to be constructed and maintained by the Shipping Board at Ponta Delgada in the Azores. Until this is ready a floating station there will be supplied by Shipping Board tankers.

Other stations have been in process of establishment at Bizerta, Constantinople, Aden, Colombo, Ceylon, Manila and Honolulu, with an initial storage capacity of from 15,000 to 20,000 tons of crude oil for each.

Terminal Improvements

The improvement of terminals is another vital need for effective operation of our merchant marine. "The charges for terminal services," says Professor Emory R. Johnson, in a recent report to the Shipping Board, "are as much a part of the costs of ocean transportation as are the freight rates." In

another report on the same subject Professor C. O. Ruggles urged, among other recommendations, the unification of railroad terminal facilities at all the important points in the United States. "The character of service at any port," says Professor Ruggles, "depends upon a large variety of factors . . . but the big problems in all ports are the same. First, adequate facilities should be provided to care for the volume of traffic offered; second, private interests should not be permitted to utilize port facilities to their own advantage; and third, there should be complete coordination among rail carriers themselves, and between rail and water carriers." Leading New York shipping men urge the importance of direct railroad connection with ships, thus doing away with light-erage problem and expense. In Boston there is only a partial connecting system. The New York-New Jersey Port and Harbor Development Commission is studying plans for the conservation and extension of port facilities, and the Shipping Board is interested in the same question regarding all of the ports of the country.

"It has been pointed out", says Professor Ruggles, "that through the industrial use of a port private interests often appropriate valuable port facilities that should be devoted to the commercial interests of the port.

"This unsatisfactory condition of affairs is the outcome of historical conditions and will be difficult to change. It would appear beyond question that deep-water frontage should be reserved for commercial purposes. Industries can be situated some distance from the water front and be served by switch connections, or they can be located on more shallow water front and have deliveries made to them by lighter. Ocean-going vessels have no choice; they must be served at the deep water front, and, other things being equal, they will

go to the ports where this elementary principle is recognized. The local interests in most ports are usually able to make themselves heard by chambers of commerce, municipal authorities, and even by State legislatures. But it ought not be forgotten that the Federal Government appropriates large sums of money annually for the improvement of rivers and harbors in the interests of commerce. If the industrial use of a port conflicts with its commercial use, it would appear to be clear which should prevail. And while it may be necessary to make adjustments with due regard to historical conditions, it is clear that it is, in the long run, to the interest of all business at a port to give preference to the commercial use of its deep water front."

These are some of the main fundamentals for the prosperous operation of our merchant marine. Before the war freight rates to and from foreign markets were largely fixed in London and Hamburg, and American manufacturers, farmers and other producers as well as exporters had to pay those rates, America having no adequate facilities to compete in the ocean-carrying trade. With an American merchant marine successfully operated, these long-prevailing conditions will, perforce, be transformed.

CHAPTER XV

Government Aid by the United States

GOVERNMENT aid in various countries to merchant shipping has been given in a variety of ways. One method has been the giving of bounties which have been outright grants without obligation of any particular service to the Government. Another method has been the subsidy or subvention conditioned upon the performance of certain defined services such as the scheduled carrying of ocean mails and the building of merchant ships to meet the plans of naval authorities so as to be available as auxiliaries in the event of war. A third method, often accompanying the other two, has been the indirect one of giving certain exclusive rights, such as reservation of coasting trade, loans to shipbuilders, exemption from import duties on shipbuilding materials, exemption from port and canal dues and other forms of assistance.

The United States Government has never granted any general bounty, similar to the bounties paid in France, Italy, Spain, and some other countries, for ship construction or operation. Encouragement to the shipping industry in the United States has, in the main, been that of indirect government aid. The act of July 20, 1789, imposing higher tonnage taxes, caused the exclusion of foreign shipping from the coasting trade. The act of March 1, 1817, specifically excluded foreign ships from the coasting trade. Not until the act of June 6, 1872, were certain materials used in the building and operation of ships allowed to be imported free of duty. But the materials thus exempted were good only for wooden ships.

In 1875 the list of exemptions was extended, and further by the tariff act of 1890 which exempted iron and steel materials. The act of 1894 extended the free list so as to include all shipbuilding materials. Subsequent tariff acts continued the exemptions. Previous to the Panama Canal act of 1912 and the ship-registry act of 1914 only American-built vessels were admitted to registry.

Postal Subventions

The only direct financial aid granted by the United States Government to private American merchant shipping has been that of postal subventions. The law authorizing these was passed in 1845, and called for specific performances of mail delivery to foreign countries. The object of this law was to assist certain American lines unable to meet the competition of the Cunard Line vessels, which England heavily subsidized. In 1847 a contract with the Ocean Steam Navigation Co. was made under this law providing a grant of \$100,000 a year for every ship making a round voyage once in two months between New York and Bremen, via Cowes, and a grant of \$75,000 a year for every ship voyaging between New York and Havre, via Cowes. The contract further required the company to build within a year four first-class steamships of at least 1,400 tons and engines of at least 1,000 horsepower. The contract was later modified so as to make the subvention payments on a monthly basis.

A subvention contract was also made with E. K. Collins, at the rate of \$19,250 for 20 round trips or \$385,000 a year, for a semi-monthly service between New York and Liverpool during eight open months, and a monthly service during four winter months. The operation of the Collins Line began in 1850. Its ships were a day faster than those of the Cunard

Line, and attracted passenger traffic. But the terms of the contract prevented the Collins ships from staying in port long enough to get a large enough cargo to make up for the high cost of operation caused by speed. Yet the competition was effective enough to cause the Cunard Line to reduce freight rates considerably. When in 1852 Great Britain increased the Cunard subvention to £173,340 (\$843,559) for 52 round trips a year, the United States raised that of the Collins Line to \$853,000 for 26 complete voyages. From 1854 to 1856 the Collins Line lost two of its four ships; Congress in 1856 took away the extra allowance, and in 1858 entirely withdrew the large financial aid, leaving only payment for actual mails transported. Early in 1859 the Collins Line passed out of existence.

A third subvention contract was with A. G. Sloo for a semi-monthly service between New York and the Isthmus of Panama, with calls at Charleston, if practicable, and at Savannah; the annual subvention was \$290,000. A fourth subvention contract was for a monthly service between Astoria, Ore., and the Isthmus of Panama, connecting at the Isthmus with the Sloo Line which operated a route from Colon to New York.

Under this contract the subvention was to be \$199,000 a year, and the company was to provide three steamers, two of at least 1,000 tons each, and make calls at San Diego, Monterey and San Francisco. This contract was assigned to the Pacific Mail Steamship Company, and service was begun in October, 1848. The rush to the California gold fields brought it great success, and a supplementary contract was made with the United States Government in 1851 by which the line agreed to a semi-monthly service, and the annual subvention was increased to \$348,250.

Comparison with Railroad Donations

Including these and one other mail contract with M. C. Mordecai of Charleston for \$45,000 subvention a year for a monthly service between Charleston and Havana, the total subvention expenditures of the United States Government from 1847 to 1858 were \$14,400,000. This, however, was a slight aid compared to the magnitude of donations extended by Congress and States to railroad projects. From 1850 to 1870 Congress made 133 separate grants of public lands to nearly as many railroad companies. Altogether, including lands granted by the United States Government and States, railroad companies received a total of about 212,000,000 acres of public lands. This estimate does not comprise gifts of valuable terminal rights, municipal rights of way, harbor rights and other rights. Nor does it include loans or gifts from the Government, States, counties and cities amounting in the aggregate to many hundreds of millions of dollars.

On May 28, 1864, Congress passed an act which began a second era in steamship mail subventions. It granted an annual subsidy of \$250,000 for a monthly mail steamship line between Philadelphia and Rio de Janeiro, the United States to pay \$150,000 and Brazil \$100,000. This line lasted from 1865 to 1876. Under a law passed in 1865, an annual subvention of \$500,000 for ten years was arranged in 1867 with the Pacific Mail Steamship Company for a monthly mail service between San Francisco and ports in China and Japan, via Honolulu. The contract required the ships operated to be built in American yards under naval supervision. The contract was modified so as to relieve the company's ships from calling at Honolulu. But the subvention to the Pacific Mail was not reduced, and another \$75,000 annual subvention was given to the California, Oregon & Mexican Line for

the operation of the Hawaiian route. In 1872 Congress passed a general sea postage law (sec. 4009, U. S. Rev. Stats.) discriminating in favor of American vessels by allowing a much higher rate for mail carried by them than by foreign vessels. Under the regulations based upon this law an American steamer received for carrying a ton of letter mail \$1,600 as against \$700 if carried in a foreign steamer, and \$160 for a ton of print mail as against \$60. In 1872 Congress passed an additional act granting the Pacific Mail Steamship Company another subvention of \$500,000 a year for another mail steamship line to China and Japan. But it developed that this act had been passed by improper means, and, on the ground of failure to perform the contract provisions, the contract was nullified in 1875. Under the ten-year contract of 1867 and the brief contract of 1872, the Pacific Mail Steamship Company received total subventions of \$4,583,000. That company succeeded, without subventions, in continuing its line from 1878 to 1915. But the disclosures as to the means used to pass the Pacific Mail Steamship Company act of 1872 had so serious an effect upon the public mind that for many years no attempt was made to restore subvention payments.

Small Direct Payments

The only direct payments made by the United States Government since the Pacific Mail contract terminated have been made under the sea postage act of 1872 or the postal aid act of March 3, 1891, which readjusted the sea postage act of 1872 on a mileage basis. This act authorized the Postmaster-General to make short-term contracts with American steamship lines, and specified four different grades of compensation per mile according to the kind and speed of ship. Except in the case of the American line (which was allowed

American registry for two foreign-built vessels on condition that two others of equal size and speed be built in American yards), all vessels on the subvention list had to be built in American yards. Furthermore, it was required that these vessels should be American owned, officered by Americans and manned largely by American crews. Iron or steel vessels of more than 1,500 gross tons had to be built under naval regulations and for use as auxiliary cruisers in time of war. The total ocean mail payments under the act of 1891 have been more than \$25,000,000 paid to various steamship companies operating on the different oceans.

CHAPTER XVI

Subsidies and Subventions by Other Countries

IN ENGLAND, Queen Elizabeth began the granting of concessions, and later bounties to encourage shipbuilding. From that period to Queen Victoria's reign, privileges were limited to duly registered British ships, navigated by British subjects.

British Methods

In modern times, Great Britain has given no bounties. It has given direct and indirect financial aid. The direct aid consisted of postal, admiralty and colonial subventions. Indirect aid has comprised reservation of coasting trade, exemption from import duties, and loans to shipowners. Of these three forms of indirect aid, the first was abolished and the second established by the free trade policy adopted in 1849 followed by the repeal of the old navigation laws in 1854, although Canada, Australia and New Zealand have restricted their coasting trade to ships flying the British flag and largely since 1903 these and other British colonies have granted preferential import duties to British goods. As to loans to shipowners, the only instance of Great Britain doing this was when, in 1903, the British Government made a contract with the Cunard Steamship Company. In addition to providing for postal and Admiralty subventions, the contract allowed a loan of £2,600,000 (\$12,652,900) at the low rate of $2\frac{3}{4}$ per cent. for the building of the *Lusitania* and *Mauretania*, the entire sum to be repaid in 20 years. The purpose of this

loan was to enable the Cunard Steamship Company to build speedy steamers of at least 25 knots which would compete successfully with the International Mercantile Marine, a newly organized American company, and the German lines, and also to provide fast auxiliary cruisers.

The principal form of direct financial aid granted by the British Government to steamship companies has been postal subventions. This policy was begun in 1837 and 1838 and has continued without intermissions. The aggregate of the sums thus granted has been very large, and the bulk of the recipients have been lines plying between England and British colonies. The Admiralty subvention serves the purpose of compensating steamship companies for the additional cost of maintaining fast steamers effective as auxiliary cruisers and transports. Colonial subventions are sums paid by Canada, Australia and other British colonies for mail ocean service. They total several million dollars a year.

France's Profuse Bounties

France has been lavish in giving bounties, subventions and indirect aid for its merchant marine. As its merchant marine fell behind compared with that of some other countries, France resorted to government aid in order to keep upbuilding its merchant marine. Indirect aid was the first policy. Since 1793 coastwise trade in French ports has, with but a few exceptions, been confined to French ships. Later, the same policy was extended to Algerian ports. Up to 1881 ship-building materials were admitted free of duty. In 1851 came the inception of postal subvention. A law passed in 1881 granted bounties or subsidies for the construction and repair and for the operation of ships under the French flag. A law passed in 1893 increased construction bounties to French

ships and abolished the half bounties granted by the previous law to foreign-built vessels. From 1881 to 1893 the French Government expended \$23,687,000, and from 1893 to 1901 about \$29,148,000 in construction and navigation bounties, but the number and tonnage of French steamers continued to decline. Navigation bounties given sailing vessels were also so high that it was found that many of these vessels did nothing but sail around the world, much of the time in ballast. Sailing shipowning companies came into existence solely to get the rich bounties. In 1902 a new bounty law, making a number of important changes, was adopted, and this was succeeded by the bounty laws of 1906 and 1912. Under the various bounty laws from 1881 to 1913 the French Government granted nearly \$37,000,000 in construction bounties and about \$97,000,000 in navigation bounties. In addition it has paid large sums in postal subventions since 1860; from 1889 to 1914 these subventions totalled about \$5,000,000 a year. All ships drawing subventions had to be built in France and have a certain speed. In the case of some later contracts the Government shared in the profits above a fixed rate of dividend for the stockholders.

Germany's Policy

Germany's aid to its merchant shipping was both direct and indirect. The indirect consisted of reservation of coasting trade, exemption of ship materials from import duties and preferential railway rates. Direct aid took the form of a postal subventions policy begun in July, 1886. The North German Lloyd line then was granted a yearly subvention of 4,400,000 marks for a 15 year period for the maintenance of various mail lines to the Far East, Australia and the Mediterranean. The contract required all its vessels to be built in

Germany, of German materials. In May, 1893, when the Mediterranean line was discontinued, the subvention was decreased but was later increased to 5,590,000 marks a year for 15 years under a law passed in 1898, requiring faster steamers. Part of this subvention went to the Hamburg-American Line which took over the Far East connecting lines, and in 1901 another part of the subvention was granted to the Jaluit Company of Hamburg which ran an auxiliary service in the Far East. Beginning in May, 1890, the German East Africa Line was granted an annual postal subvention of 900,000 marks, and when the contract was renewed in 1900 for 15 years, the subvention was increased to 1,350,000 marks. The avowed purpose of this subvention to the German East Africa Line was not only that of fast mail service, but aimed to develop and extend German trade and German colonial interests.

Italy's Liberal Subsidies

Italy has vied with France in the giving of Governmental aid to its merchant marine. Indirect aid has been reservation of the coasting trade, exemption from import duties, and refund canal duties. In 1866 a subsidy law was passed for the benefit of wooden merchant vessels and war vessels, but as iron ships were supplanting wooden, Italy's wooden ship production was small and her yards had not begun to produce iron ships. The first effective subsidy law was passed in 1885, for a ten-year period, and provided for construction, navigation and coal transportation bounties. The law of 1895 extended its provisions for ten years more. A law similar to that of 1885 was passed in 1896. A new law was adopted in 1901, and this remained in force with few modifications until the law of July 13, 1911, was passed. Under

these subsidy laws, there was granted, from 1886 to 1913, a total of \$28,852,000 in construction, navigation, coal-transportation and drawback bounties. The greater part of that total went for construction and navigation bounties. On June 22, 1913, a law was passed giving a new form of bounty to Italian cargo shipping—the payment of a yearly freight bounty equal to $2\frac{1}{2}$ per cent. of the value of the ship. Italy has also paid mail subventions since 1877. From that time they greatly increased. The law of 1910 provided for a total annual subvention of 13,660,000 lire (nominally \$2,636,380) to be distributed among 11 steamship companies. On July 1, 1913, there went into force a new subvention system providing for fixed subventions amounting annually to 16,000,000 lire (nominally \$3,088,000) for the 10 fiscal years from 1913 to 1923.

Spain's Bounties

Spain has long given indirect aid to its merchant shipping by reservation of the coasting trade to Spanish ships. Exemption from import duties, preferential taxation, reduced rail rates on export commodities, and an export bounty on coal have been other indirect methods in recent years. Direct aid was first established in 1861 when Spain began the postal subvention—a policy since continued. The tariff law of 1889 granted a bounty on ships built in Spanish yards. Apart from postal subventions and tariff bounties, no direct bounties or subsidies were paid to Spanish shipping previous to the law of 1909. Under this law there were provided four classes of bounties, one for ship construction, and three for the operation or navigation of ships. Construction bounties paid under this law have been extremely large, ranging from \$15.44 to \$35.71 per gross register ton, and including all vessels, wood

and steel. The law of 1909 also provided that general navigation bounties should be paid for a term of 10 years, and limited the total amount to be paid in any one year to 2,900,000 pesetas (\$559,700). Ships in the overseas trade were to be paid at the rate of 40 centimos (7.72 cents) per gross ton per 1,000 miles and those in the coasting trade at the rate of 50 centimos (9.62 cents) per gross ton per 1,000 miles. Among the conditions specified were that Spanish-built ships should be preferred; the entire crew should be Spanish; the Spanish mails carried free; and that the amount of cargo carried during the year must be not less than 50 per cent. of the maximum capacity of the ship, and of this at least three-fifths should consist exclusively of exports of Spanish production. The special navigation bounties under the law of 1909 provided for bounties ranging from \$1.19 to \$2.31 a mile for specified ships, routes and speed. These bounties were made conditional upon the same obligations as in the case of the general navigation bounties with additional provisions as to reduced rates for Government freight and passengers, regulation of passenger and freight rates for the benefit of Spaniards and Spanish products, and in the event of war, assignment of the ships to the Government for use as auxiliary cruisers.

Holland, Belgium and Norway

Holland's indirect aid to Dutch shipping has been that of exemption from duty of foreign-built sea-going ships and foreign materials used in building sea-going ships. No bounties or subsidies have been paid by Holland. The direct aid given by Holland has been entirely that of mail subventions to insure regular steamship and mail communication with its far-away colonies. Holland's mail subventions date from 1888, and have totalled considerable amounts.

Belgium has given many kinds of aid to its shipping. It has reserved the coasting trade to Belgian vessels. Since 1864 all ship materials have been admitted free of duty. It has allowed exemption from pilotage fees, light dues and port charges, and has granted preferential railway rates on export commodities. Under the law of 1907 it began the policy of granting loans to Belgian shipping companies, subscribing certain amounts under certain conditions, which loans were secured by the issuance of 3 per cent. bonds redeemable at par after 20 years. Loans amounting to 5,000,000 francs in all were made to three companies. From 1886 direct aid in the form of bounties or subsidies was also granted to two German lines, which also before the war were reimbursed for pilotage and other fees. These were, however, small yearly amounts. No postal subventions have been granted by the Belgian Government.

Norway's indirect aid to its shipping has been reimbursement for import duties on materials used in ship construction. As for direct aid, Norway since 1876 has paid subsidies for the maintenance of special trade routes on the Norwegian coast. Postal subventions have long been paid by the Norwegian Government for specified routes, mainly between Norwegian ports.

Sweden's Loan Grants

Sweden's policy has been both direct and indirect aid to its merchant marine. The indirect methods have been much the same as those of Norway. In 1903 the Swedish Government started granting loans at low rates of interest to ship-owners. The original fund was 5,000,000 kronor (nominally \$1,340,000) but by 1907 the fund had been increased to 15,000,000 kronor. The invariable condition of these loans

has been that the vessels be built in Sweden. Prior to 1906 the Swedish Government paid only one annual subsidy—25,000 kronor—for a regular service between Sweden and Russia. Since that time subsidies have been paid to various Swedish steamship companies operating over the world. The total of these, however, was not large—a yearly average of about \$135,000 from 1908 to 1915.

Denmark has given both direct and indirect aid to its shipping. Its indirect aid has been exemption of ships and ship material from import duties and, up to 1912, refund of wharfage charges. Bounties or subsidies and mail subventions have been its direct aid. The amounts have been small.

Austria began in 1836 the policy of granting financial aid to shipping. It assisted in organizing the Austrian Lloyds by guaranteeing the interest on capital borrowed by the company's promoters. In 1845 Austria assumed a general supervision over the company's affairs. In 1851 Austria established mail subventions and paid its first subvention in 1855. A law passed in 1873 exempted shipbuilding materials from import duties, and a law in 1890 exempted shipping companies from income and trade taxes. In 1891 Austria began the policy of reimbursing ships for Suez Canal dues. In the same year Austria began making loans to shipowners, all loans to be repaid without interest, in installments. Hungary adopted a subsidy law in 1893, and Austria later in the same year. The Austrian law of December 27, 1893, granted trade bounties, provided ships were owned to the extent of at least two-thirds by Austrians. Ships too old for a trade bounty received a depreciation bounty. A navigation bounty was also provided. The law of 1907 continued these bounties, and added construction and maintenance bounties. For iron and steel steamships the construction bounty was placed at 40 crowns

(nominally \$8.12) per gross ton, and an extra bounty for engines and other equipment made in Austria-Hungary. The maintenance bounty consisted of a maximum rate of 10 crowns (\$2.03) per gross ton per year on all iron or steel steamships completely built in Austrian yards, and a lesser annual bounty to all other seagoing Austrian ships. The law of 1907 also provided exemption from taxation.

Austria's Munificence

The total of the various subsidies paid by Austria was enormous. For example, the subsidies received by the Austrian Lloyds from 1900 to 1910 alone totalled 97,488,000 crowns (nominally \$19,790,000), or nearly three and one half times the capital of the company, amounting to 28,800,000 crowns (nominally \$5,846,000). This was only one of a number of steamship lines drawing different kinds of subsidies and subventions from Austria and Hungary.

Russia under the old regime gave such indirect aid to its shipping as reservation of the coasting trade, exemption of ships bought abroad from import duties, and preferential railway rates. From 1879 ships were reimbursed for Suez Canal dues. After 1904 the Russian Government made loans for ship construction. These loans were not to exceed two-thirds of the value of the Russian materials used, bore interest rates of 3.8 per cent., and were payable in 20 years. But few loans were applied for. In 1912 the Russian Government loaned 3,000,000 roubles (nominally \$1,545,000) free of interest and to be repaid in installments in 20 years for the building of six new steamships for the Far East trade. Loans were also granted for the buying of seagoing wooden sailing vessels for coastal service in the Russian Far East. Before 1912 the Russian Government granted no construction and repair bounties.

The law of 1912, to run 15 years, granted heavy construction bounties ranging from 105 roubles (nominally \$54.08) per gross ton for steam vessels up to 125 tons to 65 roubles (nominally \$33.48) for steam vessels of 3,000 tons and more. An additional bounty was also granted of 35 roubles (nominally \$18.03) per indicated horsepower for new main or auxiliary machinery. The same law granted a repair bounty. These bounties were conditioned upon the use of material of Russian origin in the construction of hull or machinery. After the tenth year of this law all bounties were to be reduced 6 per cent. annually. Navigation bounties were also paid by the Russian Government to specified steamship lines for the maintenance of specified routes, both seagoing and inland.

Greece has given to its merchant marine such indirect aid as exemption of ship material from import duties. The only direct aid has been mail subventions.

Japan's Generous Subsidies

Japan has been liberal in mail subventions and subsidies. Before 1880 Japan had no modern merchant fleet. The first grants were mail subventions, which dated from the adoption of the steamship. Originally these subventions were confined to the Far East service but later were extended to the Americas and Europe. In 1896 Japan passed a law, somewhat similar to that of France, giving generous construction and navigation bounties. In 1910 a new construction bounty law was adopted, fixing the bounty rate on steel ships at from 11 sen (about 5.5 cents) to 22 sen (about 11 cents) per gross ton of hull, depending upon the type of ship. The new law, although with some modifications, also continued navigation bounties. In 1910 and 1911 the Japanese Government also gave a monopoly of the coasting trade to Japanese ships.

The totals of the subsidies thus given have been large. From 1897 to 1911 alone they amounted to more than \$53,000,000. There was, it was reported, a considerable curtailment of appropriations in the subsidy budget for the five years 1915-1920 which was approved by the Diet, in May, 1915.

South American Nations

Brazil's merchant marine, the leading in South America, has been developed largely by means of liberal subsidies. The first subsidy, in 1864, was paid to an American line. Subsidies to distinctively Brazilian shipping were begun in 1896, first for a regular coasting service, and later including a line between Rio de Janeiro and New York City. Other lines engaged in inland navigation have received subsidies. The Brazilian Government acquired all of the capital stock of the Brazilian Lloyds line in 1913. By the year 1909 the total of these various subsidies paid to Brazilian lines amounted to \$1,190,882 in that year. In 1912 the Brazilian Government began the payment of subventions to four Italian steamship companies. A Brazilian Federal law also provided for a bounty of 50 milreis (\$16.62) per ton for steamships built in Brazil, but whether any payment has been made under this law cannot be learned. Since 1896 the coasting trade of Brazil has been reserved for ships of Brazilian registry.

Argentina in 1910 passed a law providing for the payment of bounties on shipping under the Argentina flag and for subsidies to shipbuilding yards. But there is no information as to whether any sums have been paid under this law.

Chile for years has given direct financial aid to both Chilean and foreign shipping, paying subsidies or bounties for the running of regular steamship lines, including the free carrying of Chilean mail. The chief beneficiary of this policy has been

a Chilean steamship company (the Compania Sud-Americana de Vapores) for regular services to Peru and Panama. The Pacific Steam Navigation Company, a British line, received for years a postal subvention for maintaining a regular line between Liverpool, Valparaiso and Callao, but it surrendered this subvention in return for valuable wharf privileges at Valparaiso.

Peru has paid a subsidy to a Peruvian line.

Mexico at different times has paid subsidies, almost entirely to foreign lines for regular service to the United States, South America and the Far East. Mexico's own merchant marine is negligible.

CHAPTER XVII

America's World Markets

MODERN commerce is peculiarly distinguished from that of all preceding ages.

In former years each nation and each part of a nation was compelled by sheer necessity to depend upon such food supply as it itself could raise. Crop failures meant unrelieved famine. Even where, as in the case of ancient Rome, food supplies were imported they were limited to the grain products. Perishable foods could not be moved afar by land or sea. Down to the nineteenth century transportation on both land and sea was slow, costly and uncertain. So were means of communication.

Commerce Transformed

Steam not only revolutionized methods of transportation but also those of handling cargoes. Before the invention of the first grain elevator at Buffalo, in 1843, grain had been generally packed in sacks and barrels and transferred by manual labor. Electricity enabled merchants to flash their orders over the globe and get almost instantaneous attention. New processes not only multiplied agricultural and industrial productivity, but also vastly enlarged the world's permanent food supply. Refrigerating kept meats, fruits and other products fresh over long land journeys and sea voyages. The canning process added wonderfully to the world's storehouse of provisions. Tank ships have greatly simplified the carrying and distribution of certain products. In the twentieth

century have come wireless telegraphy and the oil-burning ship which have further transformed commerce.

The seas themselves have been, so to speak, remodeled. Canals have effaced great distances. The Suez Canal cut the voyage from London to Calcutta from 200 days to about a month. The Great Lakes canals carved a water route to the whole world. The Panama Canal has brought continents thousands of miles nearer one another.

By these successive instrumentalities the world has become more and more a huge, sensitive, interdependent market, for the exchange of foods, materials and goods. Continents once unknown are now virtually annexed by the processes of commerce to other continents.

As transportation methods have been revolutionized, so have those of trade. Primitive barter or direct use of metallic currency were long the methods of the ship captain buying and selling cargoes. Then came the letter of credit system of one local, sectional or national banker to another. Now the operations of commerce are powerfully developed and expanded by international banking which supplies facilities for the exchange of business on a world-wide scale.

Scope of the World's Commerce

The extent of the world's normal commerce is enormous. In 1913, the year before the World War, when all nations were freely interchanging, the actual value of merchandise in the world's international trade was about twenty billion dollars. Nominally it totalled forty billion dollars, but the customary method of appraising the world's commerce is misleading. It duplicates the value of merchandise in that commerce by counting the merchandise exported from the producing country and again when that same merchandise

is imported into the consuming country. This obviously does not give the real value. Of the real total of about twenty billion dollars of international commerce, the manufactures of all nations amounted in 1913 to about eight billion dollars. Manufacturing materials represented a little more than one-half, and foodstuffs a little less than one-half of the remaining twelve billion dollars.

Under normal conditions as they existed before the war, manufactures, measured by values, formed about 48 per cent. of the total exports of the United States; 80 per cent. of those of Great Britain (the United Kingdom); 68 per cent. of those of Germany; 65 per cent. of those of Austria-Hungary; 58 per cent. of those of France, and 55 per cent. of those of Italy. About 60 per cent. of the European trade was among themselves, and the remaining 40 per cent. was oversea trade; that is to say, with other continents. Normally, manufacturing material constituted about 33 per cent. of Great Britain's total imports; 50 per cent. of those of Germany, and 60 per cent. of those of France.

Food normally formed, measured by values, about 45 per cent. of Great Britain's imports, 30 per cent. of those of Germany, and 25 per cent. of those of France. Of the world's wheat crop in 1913 Europe produced 52.1 per cent., of which nearly half came from Russia. But Europe's wheat production was insufficient for its population, and it had to import considerable yearly amounts from the United States. Great quantities of these and other of Europe's food supplies came from the United States, other parts of North America, and from South America, and Australasia. Raw materials were obtained by the world's manufacturing nations mainly from the Americas, Asia, Africa and Oceania.

For many years previous to the World War the United

States was exporting more, measured by values, to Europe than it was importing from there. Of the total imports into the United States an average of from 50 to 51 per cent. came from Europe, and of our total exports the percentage to Europe varied from 72.48 in 1903 to 59.98 in 1913.

Further, of the total imports and exports of the United States—taking the normal year 1913 as an example—19.96 per cent. of our imports came from North America and 25.04 per cent. of our exports went there; 12.01 per cent. of our imports came from South America and 5.92 per cent. of our exports went to that continent; 15.25 per cent. of our imports came from Asia and 4.67 per cent. of our exports went to Asia; 2.07 per cent. of our imports came from Oceania and 3.21 per cent. of our exports went there; 1.46 per cent. of our imports came from Africa, and 1.18 per cent. of our exports went to that continent. These percentages are based upon dollar valuations of goods, and cover fiscal years.

Changes Caused by the War

The war, of course, brought decided changes. In the fiscal year 1913 the total United States imports were \$1,813,008,234 of which \$892,866,384 came from Europe; \$361,943,659 from North America; \$217,734,629 from South America; \$314,038,218 from Asia and Oceania; and \$26,425,344 from Africa. In the same fiscal year United States exports totalled \$2,204,322,409. Of these Europe took \$1,479,074,761; North America \$617,413,013; South America, \$146,147,993; Asia and Oceania, \$194,159,465; and Africa, \$29,088,917.

The war caused a continuing diminution in United States imports from Europe and, largely because of war's necessities, an increase in our imports from North and South America, Asia and Oceania and Africa.

Our imports from Europe fell year by year until in the fiscal year 1918 they were \$411,578,494, and in the fiscal year 1919 they were \$372,953,593. On the other hand, United States imports from North America consecutively increased, reaching \$918,347,346 in the fiscal year 1918, and \$1,052,570,196 in the fiscal year 1919. The same was true of United States imports from South America the total of which rose to \$567,418,257 in the fiscal year 1918, and to \$568,374,904 in the fiscal year 1919. Our imports from Asia and Oceania more than trebled in five years, amounting to \$972,399,349 in the fiscal year 1918, and to \$1,020,912,130 in the fiscal year 1919. In the fiscal year 1918 our imports from Africa reached \$75,911,957, and in the fiscal year 1919, \$81,065,759—over three times more than the 1913 figure. The total United States imports rose from \$1,813,008,234 in the fiscal year 1913 to \$2,945,655,403 in the fiscal year 1918, and to \$3,095,876,582 in the fiscal year 1919.

On the other hand, United States exports increased to every continent, as the returns herewith given show:

Fiscal Years Ending June 30	EXPORTS					
	Europe	North America	South America	Asia and Oceania	Africa	Total
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
1913	1,479,074,761	617,413,013	146,147,993	194,159,465	29,088,917	2,465,884,149
1914	1,486,498,729	528,644,962	124,529,909	196,994,033	27,901,515	2,364,579,148
1915	1,971,434,687	477,075,727	99,323,957	192,235,218	28,519,751	2,768,589,340
1916	2,999,305,097	733,024,674	180,175,374	377,386,709	43,591,031	4,333,482,885
1917	4,324,512,661	1,163,758,100	259,480,371	489,564,198	52,733,064	6,290,048,394
1918	3,732,174,352	1,236,359,013	314,558,794	582,320,455	54,298,757	5,919,711,371
1919	4,634,816,841	1,291,932,312	400,901,601	812,276,041	85,157,432	7,225,084,257

Of the notable total of \$7,225,084,257 United States exports in the fiscal year 1919 nearly two-thirds went to Europe.

As already suggested, adequate allowance should be made, in surveying these figures, for the great and cumulative enhancement of money values in an era of unprecedentedly high prices. What proportion of the increase of imports and exports is due to higher prices cannot be precisely determined. Generally, it can be said that the average money values are about 50 per cent. higher than in 1914. It is a fact that a large part of this foreign trade was unsolicited by the United States; after it entered the war the dominating aim of the United States was to use the whole extent of its resources toward insuring victory.

Excess of Exports Over Imports

When during the war popular attention was focussed upon the sensational and huge growth of our exports, a notion spread in less informed quarters that it was only then that the United States became a conspicuously exporting nation.

But in point of fact, there have been, in many decades, only a relatively few years when our total imports exceeded total exports. The last occasion was in 1893. Our excess of exports over imports in 1911 was (in round figures) \$522,000,000. The next year it was \$551,000,000. It was \$652,875,000 in 1913. Immediately after the outbreak of the World War it fell because of violently disturbed shipping conditions.

And here, it may be parenthetically pointed out, again came another impressive illustration to the agricultural interests of the United States of what the absence of an American merchant marine meant to the farmer. Responding to Europe's demand for more foodstuffs, American farmers produced more wheat and other products, particularly with a view to export. But because of shipping conditions exporters

were confronted with an average increase of freight rates on wheat per bushel in steamships from New York to Liverpool of from three pence just before the war to $13\frac{1}{4}$ pence in 1914-1915, and later to $18\frac{1}{4}$ pence.

In the fiscal year 1915 our excess of total exports over total imports was \$1,094,000,000. In the next fiscal year it was \$2,135,599,000. In 1917 it was \$3,630,693,000, and in 1918 it was \$2,974,000,000. In the fiscal year 1919 the excess of our exports over imports was \$4,129,000,000. These figures are given in round numbers.

But considered superficially these figures do not give the real significance of our export conditions and problems.

Trade with Asia and South America

Of our total export trade more than 75 per cent. has been with Europe and Canada. Our large imports from Asia consist of indispensable products such as the tea of Japan and China, the tin and rubber of the Malay Peninsula. Yet of our total export trade, only a slight amount has gone to Asia; in 1918 it was only 7.56 per cent. The excess of our imports from Asia over our exports to Asia has continued uninterruptedly for many years both before and during the war. An instance of pre-war trade is the 1913 figure when the United States imported from Asia \$161,438,157 more than it exported there. In the fiscal year 1917 the excess of imports from Asia over exports to Asia was nearly \$235,000,000, and in 1918 the difference against the United States in the Asiatic trade was \$378,764,375. In the fiscal year 1919 the balance of Asiatic trade against the United States was \$208,636,089.

From South America the United States must import a variety of raw material and products—the wool, meat, hides and wheat of Argentina; the nitrate, copper, tungsten and

other Chilean products; the meat, rubber, coffee, cocoa, hides and manganese of Brazil; the copper, sugar and the long-staple cotton of Peru; and the copper, tin and rubber of Bolivia.

Yet our average export trade to South America has been for a decade only about five per cent. of our entire export trade. In the period immediately previous to the World War and including 1914 we annually imported from South America variously from about \$71,000,000 to \$102,000,000 more than we exported. The excess of our imports over exports in the South American trade rose during the war to \$162,165,606 in 1915; to \$211,386,644 in 1916; to \$282,732,449 in 1917; and decreased in 1918 to \$252,859,463, and in 1919 to \$167,473,303.

The Latin-American Domain

Hitherto, the fact that of our huge volume of total exports such a comparatively small amount has gone to Latin America has been especially disquieting to American industrial and commercial organizations.

The trade of Latin America, a vast region in more or less close proximity to the United States, and made much more so by the Panama Canal, should naturally flow in great part to this country. Latin America includes (excepting British, Danish, Dutch and French possessions) not only the whole of South America but Mexico, Central America and the West Indies. Its population is variously estimated from 83,000,000 to more than 89,000,000 and is rapidly increasing.

Before the war less than 14 per cent. of our total exports generally went to Latin America. In 1914 the proportion declined to nearly 12 per cent., fell to less than 10 per cent. in 1915, 1916 and 1917, and in 1918 went up to 12.25 per

cent. On the other hand, of the total United States imports, the percentage from Latin America has since 1894 never been lower than 19.67 and usually has been around 23, increasing in recent years to 34 and 36 per cent.

The status of United States trade with Asia and Latin America has all along been on a very different basis from the war trade with Europe. American shipments to Europe during and immediately after the war were largely on credit, to be liquidated later by commodities sent by Europe. But American purchases from Asia and from South America and other Latin American countries necessitate payment in money or its equivalent in merchandise. A recent report to the National Foreign Trade Convention pointed out that "unless American exports can be largely increased eventually it will be impossible to maintain these and other necessary purchases, much less increase them, without endangering the economic position of the United States. . . ." The same report expressed the opinion "that the South American countries, regarded as a whole or individually, at the present time offer the safest and most promising field for American enterprise looking eventually to an expansion of export trade."

Except the United States and Japan, all of the countries which were active in the war have, in varying degrees, suffered trade losses. Some, besides, have lost a considerable part of their former trade mechanism whether either labor power, mines, factories, shipping or all of these.

Germany has lost much in economic resources by transfer of territory and by seizure and sale of its assets in America and elsewhere, but its industrial system in Germany itself remains intact. Some former governmental entities in Europe have been abolished, and some new nations have been created. But all of the old nations are planning or considering plans

to regain their world trade, and the new nations are ambitious to establish their trade. Even in Russia, now in civil war, there is a party already planning measures for its economic recuperation and the eventual re-establishment and extension of its foreign trade, backed by vast undeveloped natural resources.

Two of the first objectives of European nations are the importation of foods and raw materials and the exportation of manufactured products. In normal times they to a considerable extent paid for their imports by a return in manufactured goods. Under the burden of vast war losses and debts they are now under all the greater necessity of increasing and selling their production in every possible way.

German Devices

Before the war the pursuit of world trade was not on a fair competitive basis.

By the creation of specially favored cartels and trusts, Germany gave her manufacturers an undue advantage. The German government allowed combinations to sell at a loss, if expedient, in order to capture a foreign market, recouping them by subsidy payments. During the war powerful new syndicates were formed in Germany, particularly in the iron and steel, textile, mining, metal, chemical and other industries. Great exporting German syndicates have been merged into a few greater combinations planning to force down the price of raw materials by making joint purchases, thus reducing the cost of production. There has also been a consolidation of German banks. As Germany was disciplined in the military sense, so every preparation has been made to discipline it as a unity in the industrial sense. If the latest despatches are to be credited enforced labor is planned on a

long work-day basis and under a sort of military discipline, and it is avowed by German industrial leaders that the working classes are willing to accept this program.

Germany's New Plans

At present Germany is practically destitute of ships to carry its exports and imports, and has to depend upon the ships of other nations. According to a Bremen correspondent of the *London Times*, (September, 1919), Germany owns now only three and one-quarter per cent. of its pre-war tonnage.

But this lack is not interfering with active preparations for foreign trade. The *Marine News*, November, 1919, stated that to aid German steamship lines, such as the Hamburg-American and the North German Lloyd companies, the German Government had "decided to begin the distribution of an indemnification grant estimated at more than 250,000,000 marks (\$62,500,000). This will include indemnification for the ships and property of German steamship lines seized in New York and elsewhere." There is no expectation on the part of German shipping men of immediately being able to rebuild, but they hope to make a working arrangement with the ship companies of some other countries.

United States Commercial Attache Paul L. Edwards reports from the Hague, Netherlands, that Germany has a new Foreign Trade Bureau connected with the German Ministry for Foreign Affairs. This Bureau is headed by an administrative council of 25 to 30 members, all experts in various business lines. The purposes of the Bureau are to do away with the old bureaucratic system; to train members of the diplomatic and consular service in commercial affairs and have them meet German merchants and manufacturers; and to disseminate daily and directly commercial information

received from the consulates and legations. This information will be distributed in two ways. Information of a public nature will be issued in a daily bulletin, the publication of which has already been begun. Confidential information will be sent on the day of its receipt not only to commercial organizations but to all persons interested.

British Problems

Both England and France have been preparing for world trade competition. The committee appointed in 1916 by the Chamber of Shipping of the United Kingdom and the Liverpool Steamship Owners' Association reported in 1917 that the governing factor determining the general trade policy of the United Kingdom must be the necessity of finding markets for Britain's exports of manufactures and coal. Each year, the report declared, Britain had to realize abroad nearly £500,000,000 from the sale of these exports to enable that country to obtain in exchange food supplies to the value of about £300,000,000 and raw material of about the value of £200,000,000.

The British Government has recently been encouraging the organization of shipping and other combinations, and indeed the traditional ingrained individualism of the British people is changing under the necessity of industrial and commercial regimentation. Great Britain is a manufacturing country, and the fact has been pointed out that unless she can produce and market her production, millions of her people will have to emigrate or starve.

Great Britain during the war borrowed heavily from the United States and various neutral countries, while on the other hand making loans to France and other Allies. If the laws of supply and demand indicate logical probabilities, then

Great Britain in order to pay off its debts will predominantly seek to export to the United States and other countries to which it is indebted rather than to those which are indebted to it.

British Credit Insurance

The latest method by which the British purpose to assist in advancing foreign commerce by insuring against bad debts abroad is told by Consul-General W. Stanley Hollis, London, in a paper published in the "Commerce Reports." The British Trade Corporation, heavily capitalized, was organized in April, 1917, to carry on the business of trading and banking in any part of the world. Its powers are broad. It has formed the Trade Indemnity Company, authorized to write credit insurance.

The object of the new company is to assist British merchants and manufacturers in developing overseas business by insurance. Policies are issued insuring the payment of commercial debts, thus enabling an exporter to increase his present volume of trade without incurring greater capital responsibilities. Under approved conditions the company will advance to the assured the amount of its liabilities in respect of any debt insured, against transfer of the debt, and payment of interest on the amount advanced until the net outcome of the estate is ascertained. The company grants policies insuring up to two-thirds of a client's whole turnover against ultimate loss. Policies are also granted to cover a proportion of such losses as may arise should a forced resale of goods become necessary in consequence of buyers becoming insolvent and thereby unable to take up shipping documents. The company likewise grants policies insuring against a proportion of trader's losses in any one year in excess of an agreed per-

centage of loss on turnover to be borne by the assured. The company is also prepared to grant policies insuring approved accounts up to three-fourths of the amounts of a debt.

France, also, has been organizing new agencies for the development of export trade, and has been encouraging combinations in shipping. Although many of its utilities were ruined in the war, France expects the German indemnity to cover considerable of the restoration cost. Before the war France's deficit in coal supply was nearly 25,000,000 tons, and the destruction of French mines by the Germans increased this deficit. The restoration of Alsace-Lorraine adds greatly to France's coal and iron deposits, and, by the peace treaty terms, Germany is obliged for 10 years to supply stated amounts of coal to France as restitution for coal properties destroyed. But it is officially said that France has begun to develop increasingly its water power which is estimated potentially at 6,000,000 to 8,000,000 horse power.

The neutral countries of Europe profited richly during the war by sales of goods and loans to both sides. Although their material resources have thus been much depleted, they have immensely increased their credits and capital, and are in a much more advantageous position than before the war to purchase goods from other countries. The prospects seem to point to an increased demand from these neutral countries for United States products, although the rate of exchange of some of the neutral countries has recently been a deterrent.

CHAPTER XVIII

America's Preparations for Trade Expansion

THE UNITED STATES, by reason of new legislation and other developments, is in a much stronger position than before the war to extend its foreign trade.

Powers Given by the Webb Act

The Webb Act, passed by Congress, in April, 1918, allows, as already mentioned, full latitude to American combinations for foreign trade. Although this law was enacted during the war, the motive animating Congress was to have legislation in force for the period after the war and place American exporters in a better position to meet the methods of foreign combinations.

The whole intent of the Webb Act is expressed by its title, "An Act to promote export trade and for other purposes", and its purpose is to have export trade transacted on fair and legitimate lines. The necessity of such a law arose partly from the need of countering the trade machinations and manipulations of certain foreign countries, and partly from the need of freeing the foreign trade of the United States from the strangling restrictions of the Sherman anti-trust law.

The Webb Act specifically provides that nothing in that law "shall be construed as declaring to be illegal" any combination of business interests formed solely for export trade and actually engaged in it. To insure fair dealing the Webb Act expressly provides that the prohibition of the Federal Trade Commission Act against unfair methods of competi-

tion shall apply to the methods used by export combinations against their competitors in export trade, even though those acts are done outside of the territorial jurisdiction of the United States. The Webb Act permits combinations in export trade only, and prohibits the resale within the United States or its Territories of any goods thus exported. Export combinations are not, however, required by the Webb Act to sell directly to foreign buyers; it is only necessary that the sales should be for export.

Many American Combinations Formed

The administering of the Webb Act has been vested by Congress in the Federal Trade Commission. By April, 1919, about 80 combinations formed for export trade had filed statements with the Federal Trade Commission, and more combinations have since been organized. They have included a variety of industries—silks, chemicals, copper, textiles, hardware, lumber and many other kinds of products. These combinations have comprised small as well as large concerns, but have been confined to those dealing in special products.

More recently, however, a comprehensive organization—the Namusa South American Corporation—to deal in every variety of products was organized under the auspices of the National Association of Manufacturers. According to the announcement of the formation of this Corporation, the charter has been framed to permit any group, or any number of groups to engage in export trade activities under one general overhead. Broadly the plan “provides an active, efficient and economical organization by which American manufacturers will present a united front in world markets, enabling them to combat foreign competition effectively, to procure trade accommodations from foreign governments, to facilitate

satisfactory shipping, forwarding and banking relations, to work for equitable customs and tariff regulations, to minimize possible discrimination against American producers, to oppose imitations of American products, to discourage any unfair practices in foreign trade, and generally to uphold abroad the integrity of American manufacturers and merchandise as well as to protect the foreign buyer". There has also developed a keen realization of the importance of studying Latin-American local needs and tastes, and supplying them accordingly.

Stimulations To Trade

Early in October, 1919, the United States Shipping Board announced a reduction of approximately 33 per cent. in the freight rates between North Atlantic ports and South America,—a move which, it was expected, would further stimulate trade to that continent. In that month the Shipping Board had 93 vessels on the South American east coast trades, 18 vessels on the South American west coast trades, and 175 vessels on the West Indies—Carribean trades.

With these great and systematic preparations to extend our foreign trade, the question as to the payment for our exports urgently presents itself. The fundamentals of international trade are the exchange of commodities in one form or another. Speaking before the National Foreign Trade Council's Convention on April 24, 1919, Edward Prizer, president of the Vacuum Oil Company, emphasized the importance of this question and made this constructive suggestion: "England as a nation has learned to take foreign stocks and bonds, and a sharing interest in local enterprises, in payment of her exports. We, too, as a nation must learn to do the same if we are greatly to expand our exports."

Improving Our Consular Service

The diplomatic and consular service bears an integral relation to our foreign trade. Selections for this service have usually been made for partisan political considerations, each State receiving a certain quota of appointments. Formerly the consular service was filled with inferior men. They regarded their offices as sinecures, their tenure as temporary, and were often more absorbed in social pastimes than in serious performance. Within the last 15 years there has been, to a considerable degree, a noteworthy change in the character of our consuls. Many of their reports published by the Government unmistakably evidence an understanding of commerce and a keen interest in advancing the commercial welfare of the United States.

The National Civil Service Reform League now urges a thorough change in the reason and mode of appointments. In a report issued on September 14, 1919, it recommended that the merit and promotion system, based upon examinations and proved capacity be substituted for politics; that adequate salaries be paid; that the whole service be completely Americanized by the appointment of competent vice-consuls to act in the place of foreigners now serving; and that examinations be held every year for those wishing to be transferred from the consular to the diplomatic service or vice versa.

" Measures to build up America's commerce in all parts of the world so as to provide business for our great merchant marine have been taken by the United States Shipping Board. Chairman John Barton Payne sent, on January 2, 1920, to the Secretary of State a letter in which he announced that agents of the Shipping Board were being sent to many parts of the world to coöperate with American Consuls. The duty of these agents will be to give every aid possible to

American interests and to pay particular attention to arranging for the speedy loading and unloading of American tonnage. Decision has been made so far to establish headquarters for the agents in the following places: London, Liverpool, Newcastle, Cardiff, Paris, Havre, St. Lazarre, Larochele, Dunkirk, Bordeaux, Marseilles, Rotterdam, Antwerp, Hamburg, Copenhagen, Naples, Gibraltar, Lisbon, Bermuda, Havana, Panama, and Shanghai. Agents at these headquarters will cover certain specified territories. The Paris headquarters, for instance, will reach out into France, Spain, and parts of Portugal.

Measures for Superior Proficiency

At the same time American business men are establishing undertakings aiming to insure higher proficiency in our foreign trade relations.

Since its inception in 1914 the National Foreign Trade Council has urged commercial education for foreign trade. "We have at our very doors the West Indies, Mexico, Central and South America, where the Spanish language predominates and where the Portuguese language prevails to a considerable extent," recently reported a committee of the New York Chamber of Commerce on the subject of commercial education. "We are not well equipped to take this trade that by propinquity and natural reciprocity should be ours. As a nation we should be so familiar with Spanish, Italian, French, German, Portuguese and even Russian, that we could meet the representatives of the countries where these languages prevail, and do business with them in their own language." The committee emphasized the fact that this inability to come into conversational intimacy with the people of other countries has been one of our most embarrassing handicaps.

In commercial transactions Latin Americans are markedly influenced by qualities of personal contact. Our business men "cannot do business in the language of foreign countries with whom they have commercial dealings. They have to employ their rivals to conduct their negotiations and carry on their business abroad."

The Committee proposed that the New York Chamber of Commerce encourage in every practical way a prescribed course of studies in the various educational institutions, and then itself hold examinations, issuing certificates of proficiency or diplomas to those successfully passing. The committee described how the Chamber of Commerce in London has, since 1890, been conducting examinations and issuing certificates of proficiency, and how successful the system had proved. In Paris there have been special schools under the direction of the Chamber of Commerce and the Minister of Commerce to provide commercial education. In Germany there have long been a number of higher schools of commerce. "The proposed certificates issued by this Chamber," the New York Chamber of Commerce Committee reported, "would possess a commercial advantage that would cause them to be sought, and would, therefore, be an inspiration to commercial education." A plan for commercial examinations has been established by the New York Chamber of Commerce.

Rush for Commercial Education

"Interest in commercial education has this fall attained proportions never before approached, according to virtually unanimous testimony of those concerned in this field," reported the New York *Journal of Commerce*, October 10, 1919. "Applicants for instruction have come forward in such numbers that in many instances it has been found necessary for

schools to refuse them, both because of the limitations of space and of available instructors. The movement is said to be augmented by the support of large numbers of downtown business and commercial companies, who are encouraging their employes to take up such studies as may improve their efficiency. . . .

"The case of the Wall Street Division of New York University is typical of the conditions reported by various institutions. To accommodate the classes enrolled rooms have been obtained in the Produce Exchange, the Coffee and Sugar Exchange and the Merchants' Association, which have extended their co-operation that the largest number might be taken care of. Several courses have been closed to further applicants because of the pressure for space, and others have been held open only because larger rooms were secured than were called for in the original plan. With interest at its present high pitch, the need of the Division is stated to be a special building in which provision could be made for equipment not now practicable.

"A similar condition exists in the School of Commerce of New York University further uptown.

"The department of Extension Teaching of Columbia University reports unparalleled interest in its business courses, with three times the usual enrollment. No applications have been refused, but difficulty has been experienced in obtaining room for all the courses and in obtaining competent instructors. . . .

"At the Twenty-third Street branch of the College of the City of New York, which is devoted to business and commercial courses, an enrollment of 3,000 was reported, far exceeding the figures for other years and crowding the building to the limit. It was stated that the foreign trade and shipping

courses, as well as accounting, business law and economics, and commercial French and Spanish were attracting chief attention.

"These are only three of the more important institutions where business and commercial training is available, but what has happened in their case has been with minor differentiation the experience at other schools. . . ."

Since this article was published, the New York University (early in December, 1919), obtained possession of the Trinity School Building on Trinity Place, and will use it for the downtown classes of the School of Commerce. In making this announcement, Joseph French Johnson, Dean of the School of Commerce, said in part: "The School of Commerce opened its downtown department in 1914 with a handful of students. There were 250 enrolled in the classes of 1916, when Dr. Taylor came from the Far West. Today more than 2,000 students, mostly recruited from the downtown banks, brokers' offices, insurance companies, steamship and railway offices, and export corporations are listed for the studies of the institution."

The culmination of the movement for commercial education for foreign trade came recently when plans for the establishment of a School of Foreign Service at Georgetown University, at Washington, D. C., were announced by James A. Farrell who headed the subscription list with \$20,000. Mr. Farrell expects that the \$500,000 fund needed will be fully raised from American business men. Japanese and Russian as well as French, Spanish and Portuguese will be taught, and more languages added as America's trade opportunities grow. Besides the language courses, there are to be economic and commercial, law and political science, and shipping courses.

CHAPTER XIX

Improving America's Shipping

ONE vital reason why the export trade of the United States did not attain the greater proportions that it should have reached was the fact that America long had no real merchant marine. In seeking foreign markets for its goods, American merchants were compelled to ship in vessels of other nations which fixed the freight rates that had to be paid on goods sold in competition with them.

Now that the United States has a plenitude of shipyards and a large merchant marine, the question engrossing general attention is how to make both serve the purposes of peace time trade. It is significant of the altered attitude in America that not only are commercial bodies deeply interested in this but also farmers' organizations. Thus at the recent conference of shipbuilders in Washington a considerable number of representatives of farmers' organizations were present, and their comments showed an appreciation of the importance to the United States of a large and successful merchant marine.

Shipping Policy Advocated

At Senator Ransdell's Merchant Marine Conference in Washington, January 22, 1919, prominent shipping men urged that the Government should adhere to its policy, declared in the United States Shipping Act, approved September 7, 1916, to encourage, develop and create a merchant marine to meet the requirements of the commerce of the United States with its territories and possessions, and with foreign countries. The

Government should further, it was urged, adhere to its repeatedly declared policy of withdrawing from Government ownership and operation of ships and from the fixing of freight rates in foreign trade. It was pointed out that the sole intent of Congress was to prohibit unfairness and discrimination and that "any further attempt at regulation of international rates will be prejudicial to the interests of both shippers and shipowners in the foreign trade by imposing on such trade a burden of regulatory provision not found in the laws or regulations of competing nations."

Also it was urged that the ships suitable for the foreign trade owned or being built by the Shipping Board be sold to private owners for management and operation in foreign trade.

The conditions of sale proposed were that the valuation per ton was not to exceed the lowest cost of construction of similar tonnage in standard shipbuilding yards of our principal competitors, and at similar valuation for used ships, less the usual allowance for depreciation for age. Payment, the proposal further read, should be 25 per cent. in cash, the remaining 75 per cent. to stand on mortgage at four per cent. interest payable in fixed installments during a 20 year period, and all corporations, firms or individuals buying those ships for operation in the foreign trade should be exempt, respecting those ships, from all Federal and State taxes upon their capital stock, ship franchises, profits or earnings during that period or for as long as the legislation remained unchanged.

Another proposal made at the Conference was that the Government assist existing lines in the construction and operation of new passenger tonnage of the highest class and latest design and type, and in the developing of additional passenger lines to countries with which it is desirable, in the

national interest, that passenger service should be established. This, in turn, would have a beneficial effect upon foreign commerce. It was suggested that some plan similar to that adopted by the British Government in the building of the *Mauretania* and the *Lusitania* might be expedient.

Furthermore it was urged that the mail subsidy laws should be revised to meet the additional costs of reconstructing and operating these lines, as compared to the costs of foreign competition. Mail grants, it was additionally proposed, should be adjusted to the speeds economically practicable in the different trade routes. Finally, it was urged, provision should be made for the incorporation, under a general Federal Incorporation Law, of steamship companies operating in foreign or interstate commerce.

These proposals have the support of P. A. S. Franklin and other leading shipping men.

Merchant Marine Association's Proposals

Resolutions embodying the convictions of the National Merchant Marine Association were presented to the Government in September, 1919.

These resolutions declared that "it is essential to the permanent success of an American merchant marine that the vessels comprising it should ultimately be owned and operated by American individuals, firms, corporations and associations." The Association recommended that as many of the Government-owned steel vessels of desirable commercial types as are not needed for the immediate development of new trade routes should be sold for operation under the American flag to Americans either individually or as firms or corporations the majority of the stock of which was owned by American citizens. The prices should be reasonable, based

upon the current market price and with full allowance for competitive conditions. The Association recommended that vessels of other types be sold as rapidly as possible without restrictions as to flag or purchaser but giving preference, on equal terms, to American purchasers. Pending their disposition by sale, the resolutions continued, Government vessels should, as far as possible, be chartered to American concerns upon a basis favorable to successful operation, and that options be given to the lessees to buy the vessels within a reasonable time.

Until sold or chartered, Government-owned vessels should, the resolutions held, be operated by the Government through American operating or managing agents under guarantees for the management and upkeep and to be subject to cancellation of contracts for inefficient management. The resolution further declared that Government-owned and operated vessels should not compete with privately-operated vessels in cases where the latter were furnishing adequate service. Preferably, the resolutions said, Government-owned and operated vessels should be used in the development of trade routes new to American vessels.

The Government's policy should be, the National Merchant Marine Association urged, to develop and stabilize routes from various United States ports so as to avoid uneconomic port congestion during periods of heavy movement. In developing these new trade routes, the resolutions proposed the Government's policy should be the seeking of an equitable division of trade with other maritime nations, and an attempt should be made to work out a form of international co-operation covering rates and routes. Finally, the resolutions favored the requiring, for all steamship-owning and operating companies, of a Federal charter providing for the exercise of

close supervision of capitalization, stock issues and bonded indebtedness.

Shipping Board's Recommendations

Private ownership and operation of ships was the United States Shipping Board's recommendation in a formal statement presented to Congress, June 10, 1919. This, the Shipping Board declared was, in its opinion, a fundamental policy for commercial shipping.

The Shipping Board urged that at the earliest convenient date the Government should contemplate retirement from all commercial shipbuilding, ship-owning and ship-operating activities, and leave the overseas trade free to the full benefit of competitive service. The Government's withdrawal was necessary, the Shipping Board said, in order "to impart to present and prospective steamship operators that confidence which they must feel before they can be expected to invest their money in existing ships without which the outlook for the American shipbuilding industry will not be encouraging."

The Shipping Board recommended legislation that would allow Government-owned steel vessels to be sold to American citizens at the current world market price, 25 per cent. of the purchase price to be paid on delivery, the remainder in graded installments over a ten-year period. Power also was asked to sell superfluous vessels, such as coal-burners under 6,000 deadweight tons, to foreigners at prices not less than to Americans, the proceeds to be used to build such vessels as the United States needs for an adequate, well-balanced and properly co-ordinated merchant marine.

The Shipping Board further recommended that Federal charters should be given all American concerns operating vessels bought from the Government, on condition that the

stockholders be American citizens, the capitalization and securities be regulated, and that during the period in which the Government owns an equity in the property, the board of directors shall include one Government director, without salary.

Ship Mortgages

Another recommendation made by the Shipping Board—and one that particularly has the approval of all practical shipping men—is that before any large-scale financing of the purchase and operation of ships can be undertaken in the United States, it will be necessary to change the legal status of ship mortgages in order to make them attractive popular investments. This is a phase of the subject to which earnest legislative attention is being given.

Ship-mortgage banks are virtually unknown in the United States. But in England, Holland, Denmark and Germany they have long been instrumentalities in placing finances at the disposal of ship-owners for the building of new tonnage or the buying of existing vessels. These banks have advanced money on the security of the ship itself in much the same way that a mortgage is placed on real estate, and some of them have paid large regular dividends and bonuses. Hitherto it has always been difficult in the United States to arrange mortgages on ships because our laws regarded ships not as property but as instrumentalities of commerce. There has been before Congress a bill designed to create a system of recording mortgages on ships, and amending the existing law so as to provide that notes given as part payment for the purchase of ships shall be first liens secured by mortgages on the ship itself and making the mortgage lien superior to all other liens.

"The Shipping Board is confronted with the program of disposing of these ships to American citizens," Judge John Barton Payne, chairman of the U. S. Shipping Board, stated. "A good many people who are applying for ships are entering the business practically for the first time. They are small people, their resources limited. Unless we can get a mortgage which will give the United States amply security, it is not advisable to sell these ships to persons of that kind. We think therefore, that it is a matter of first consideration by the Congress to frame a mortgage law which will give to the United States, in the very first instance, and, later to other investors in securities of this kind, a lien that is a very first lien.

"It will scarcely be possible to create, establish and maintain a successful merchant marine unless this bill is passed. In England they are in the habit of dealing with securities of this character, that is ship securities, and in this country we are not, and the country must be educated to the point of absorbing the present Government-owned ships, and the first step, and in my judgment, the controlling step in that direction is the passage of such a law as this. We are co-operating with the bankers. We formed a committee of the investment bankers for the purpose of getting the banks of the country to consider loaning money to prospective ship-buyers. In other words, we are doing what we can to educate the investing public to dealing with ship securities. We regard this as a fundamental necessity."

Henry M. Robinson, a former Commissioner of the United States Shipping Board and a leading figure on the investment bankers' committee, estimated that there would be \$2,500,000 of ship securities that would have to be absorbed by private investors.

Change of Subvention Laws Urged

In its memorandum to Congress outlining a proposed national shipping policy, the Shipping Board further declared that our subvention statutes were obsolete. They were based, it said, "on the principle of paying a bonus which was not large enough, and could not in justice be made large enough, to call into existence on its own account the large, fast vessels to which the law made it payable."

This principle, the Shipping Board recommended, should be discarded and there should be adopted a new principle of paying for the carrying of the overseas mail, including an extension of the parcel post, on the basis of service rendered. Such a change, the Shipping Board holds, would powerfully stimulate our foreign trade "inasmuch as a constant flow of mail between American business men and their foreign customers would give more reliable service than the occasional and at present uncertain and inadequate communication provided by passenger liners." United States mails, the Shipping Board urges, should be carried in all American vessels plying regular routes at a speed of 12 or more knots an hour. That all vessels flying the American flag should be equipped with the wireless telegraph, is another recommendation.

Proposed Government Policy

Bills were introduced in both Houses of Congress to enact into law the Shipping Board's recommendations. The bill of William S. Greene, chairman of the House Merchant Marine and Fisheries Committee, was unanimously reported by that committee in October, 1919, and passed by the House of Representatives by a vote of 238 to 8 on November 8, 1919. The main feature of that bill comprised private ownership

of our merchant marine; taking from the President control over the Shipping Board and centralizing authority and responsibility in that body; and the return of ships to their owners, or the sale by the Shipping Board as soon as possible of all ships on long-term payments up to ten years to facilitate their purchase by private owners. The bill prohibited sales to aliens unless the vessels were not wanted by American citizens. Another provision instructed the Shipping Board to discontinue ship-building as far as consistent with good judgment, and required that the Shipping Board make no further investments in new ships or plants, but withdraw as quickly as possible from all investments, and turn the money in to the United States Treasury. The bill further repealed the power of the Shipping Board to control ocean freights and charters, and provided that all requisitioned property in which the Government had no financial interest must be returned to its owners.

Outlining the Government's policy, as determined by the House Merchant Marine and Fisheries Committee after numerous hearings on the subject, Chairman Greene said in part:

"It is apparent to every one familiar with the shipping problem that America must act quickly if it expects to compete successfully with other powerful maritime nations, like Great Britain. If we act intelligently and with proper co-operation, there is not the slightest doubt that we shall become one of the leading shipbuilding nations of the world. We shall have the largest number of shipyards, the materials and the labor, and when our shipbuilding plants are completed and well organized on sound business principles, so as to produce ships cheaply and rapidly, we shall not only produce

ships enough to become the leader in the commerce of the world by furnishing transportation at reasonable rates—thereby performing a service to the rest of the world—but we shall build ships, I venture to state, in such large numbers and at such fair prices that we shall become the Mecca of the ship-building trade of the world.”

Two bills were introduced in the Senate, on November 3, 1919, by Senator Wesley L. Jones, chairman of the Senate Committee on Commerce. One bill sought to create “The United States Marine Corporation,” a body entirely separate and distinct from the United States Shipping Board which was to be restricted to its original powers.

The new corporation, according to the bill, was to continue for a term of 30 years, was to have nine directors appointed by the President for a term of eight years, and all of the ships, shipyards and other property of the United States Shipping Board Emergency Fleet Corporation were to be transferred to it. This new body was authorized by the terms of the bill to construct, maintain, operate, sell, lease, charter, exchange or otherwise dispose of United States vessels, to deal in maritime securities, make contracts, and establish port, terminal and warehouse facilities. But it was prohibited from competition with existing steamship lines.

The other bill of Senator Jones provided for the return of vessels to their owners, and the disposition of all other vessels by the United States Shipping Board at public or private sale. The sales were to be made on installment payments over a period of not more than 20 years. The proceeds were to be turned into the United States Treasury, and used for the establishment and maintenance of port, terminal and warehouse facilities, coal or oil bunkers, or for new ship construction as the Shipping Board might deem necessary.

A Staff of Cadets

Still another need advocated by the Shipping Board is the necessity of new legislation to provide a regular and experienced staff for our merchant marine. All merchant ships, the memorandum set forth, should be required to carry at least two, and not more than ten cadet officers, half to be trained as deck, and half as engineer officers. "The course should extend over two full years. The cadets should be paid living salaries by the Government, and the Government should pay the steamship companies fees for their tuition. They may be selected from the boys who have already elected to follow the sea, or from those who wish to do so."

There are thus already before Congress definite proposals which if adopted are regarded as certain to put our merchant marine on an effective competitive basis and greatly improve the opportunities of the United States in obtaining far more foreign trade and holding it. Recently a committee, composed of P. A. S. Franklin, Homer L. Ferguson, Alfred G. Smith and other shipping leaders was appointed to make, through the Shipping Board, recommendations to Congress regarding changes in our navigation laws particularly covering measurement of vessels, revision of rules respecting standardization, construction, inspection, and other matters of a technical nature. The object sought is to place American sea-going tonnage on practically the same basis as foreign-operated ships, thus taking further steps to assure fair competition.

Encouraging American Seamanship

This committee approved the Rowe bill, which later (October, 1919), was passed by the House of Representatives.

The object of the Rowe bill is, by reducing the time that they have to serve before gaining their ratings as able seamen, to encourage American boys to go to sea. Under existing law the prior time of service is generally three years. The chief innovation of the Rowe bill as originally drawn was a provision enabling a sailor to qualify after six months' service at sea. This provision was later modified in hearings before the House Committee on Merchant Marine and Fisheries, and the time limit in the bill as passed was placed at a year. The bill further provided that no vessel should depart from an American port unless she had on board a crew, not less than 75 per cent. of which, in each department thereof, might be able to understand any order given by the officers of the vessel, nor unless 20 per cent. in the first year, 30 per cent. in the second year, 40 per cent. in the fourth year and thereafter 50 per cent. of her deck crew, exclusive of licensed officers and apprentices, were of a rating not less than able seamen.

Another committee appointed by the United States Shipping Board to make a study of the marine classification societies, with a view of submitting its recommendations to Congress, recently recommended that the United States Government extend its backing to the American Bureau of Shipping and give it preference over Lloyd's Register of Shipping.

CHAPTER XX

The Port of New York

THE port of New York is the foremost in America. Among the world's ports it excelled before the war and it still leads in the registered net tonnage of vessels entering and clearing in the foreign trade. In only one respect, that of the value of foreign commerce, was it formerly surpassed. London in 1914 was superior in this regard. Liverpool, however, later exceeded London in value of foreign commerce, according to the 1917 and 1918 British statistics, and Liverpool was out-ranked by New York.

In the calendar year 1917 London's foreign commerce, including imports and exports, was \$2,461,479,000 and Liverpool's \$2,905,231,000. In the calendar year 1918 London's total foreign commerce was \$2,633,659,000, and Liverpool's \$3,319,416,000. In the fiscal year 1917-1918, the foreign commerce of the port of New York amounted to \$3,864,435,000.

Through the port of New York there passed before the war an annual average of about three-fifths of the imports and about three-eighths of the exports of the United States. In the fiscal year 1913-1914, when shipping conditions were normal, the net register tonnage of vessels entering New York was 15,767,547, and that clearing New York was 15,421,394. In movement and quantity of tonnage in the world's ports, Hamburg was next with, in 1913, a little more than 14,000,000 tons in entrances and clearances each. Then in order on the list came London, Liverpool, Antwerp, Rotterdam and Hong-

kong. Statistics of different countries are, however, not always comparable, as different nations report different kinds of tonnage.

Its Enormous Commerce

The war reduced Hamburg to a ghost of its former self, commercially speaking. Cargoes from all parts of the world which formerly were sent to Liverpool as the world's great disposal mart, were shifted to various American ports. The world's shortage in ship tonnage was felt everywhere. In the United States the Government policy has, since 1917, been one of utilizing many ports for the receiving and despatch of cargoes, and of diverting to other ports freight intended for New York. Nevertheless, the port of New York has maintained its preeminence, despite also the fact that as a whole the port has long been handicapped by a differential railroad freight rate in favor of other ports. Of the total United States imports of \$3,095,876,582 during the fiscal year 1919, \$1,433,504,899 came through the port of New York. Of the total United States exports of \$7,225,084,257 during the same fiscal year, \$3,204,992,419 went out through the port of New York. In the calendar year 1919, commerce passing through the port of New York reached the total of \$5,505,059,124, as compared with a total valuation of \$3,811,756,039 in the calendar year 1918. These figures include both exports and imports. The estimated total for the whole of the United States in the calendar year 1919 was \$11,975,275,375.

During the fiscal year 1919 the vessel tonnage movement in the foreign trade in the port of New York was:

Entered, 4,655 vessels of 11,531,885 net registered tonnage.

Cleared, 4,602 vessels of 13,326,340 net registered tonnage.

But foreign trade is only one phase of the immense ship-

ping activities in the port of New York. There is also the coastwise trade. This, in the fiscal year 1919, comprised:

Entered, 3,287 vessels of 5,539,724 net registered tonnage.

Cleared, 3,339 vessels of 5,574,571 net registered tonnage.

Extent of Waterfront

The port of New York with its fine natural advantages, covers not only the five New York City boroughs but also the New Jersey section of the harbor. The total length of the direct water front around the city of New York is 578.4 miles. Including the New Jersey stretch it is 750 miles. But measured around piers and heads of slips the length of the ports water-front in New York City is 745.8 miles, and including 240 miles on the New Jersey side, the grand total is 985.8 miles.

Of the 578.4 miles of direct water front in New York City, 43.2 miles are in the Borough of Manhattan, 57.1 miles in the Borough of Richmond, 79.8 miles in the Borough of Bronx, 196.8 in the Borough of Queens, and 201.5 miles in the Borough of Brooklyn.

The 745.8 miles of New York City's waterfront, measured around piers and shore line, comprise 82 miles in the Borough of Richmond, 89 miles in the Borough of Bronx, 96.4 miles in the Borough of Manhattan; 219.5 miles in the Borough of Queens and 258.9 miles in the Borough of Brooklyn.

New York City's developed water front (measured around piers and along the heads of slips) totals 271.4 miles as follows: Bronx, 19.8 miles; Richmond, 32.6 miles; Queens, 39.5 miles; Manhattan, 76.8 miles; Brooklyn 102.7 miles.

Improvements under consideration indicate additional wharfage.

Present and Projected Piers

There are 695 piers in New York City. New York State owns eight; New York City 255½; the United States Government 22; and 409½ are privately owned. Of those municipally owned, more than 100 are used by the Dock Department for wharfage purposes; about 138 are leased by private corporations, many of them railroad companies; and about 15 are held under permit by private parties or are occupied by City departments other than the Dock Department.

On October 25, 1919, the Board of Estimate, of New York City, on the application of Murray Hulbert, Commissioner of Docks, appropriated \$5,300,000 for the purchase of land and rights necessary to be acquired for the building of 14 new piers on Staten Island.

Plans have also been prepared for the development of a large extent of Jamaica Bay waste land and land under water owned by the City of New York in the Borough of Brooklyn. The ultimate completion of the project will create 20 miles of improved wharfage for commercial and industrial purposes. This new wharfage will have a capacity of more than 15,000,000 tons, which alone is in excess of the total foreign business of any American port except that of New York. For the full construction of this wharfage an expenditure of about \$29,000,000, it is estimated, will be required. There will be provided a co-ordination of water, rail and truck connections. This particular project, however, is still in an indefinite stage and although having great potentialities is not a tangibility.

Area of the Port

The port of New York takes its name from New York City but it actually embraces more than 50 municipalities in both

the States of New York and New Jersey. In fact, counting cities, boroughs, towns, townships and villages, the New York City Metropolitan Districts comprehends 93 in all.

The United States Bureau of the Census 1914 report on New York manufacturers, published in 1918, states that the New York City Metropolitan District embraces 616,928 acres of territory, of which 183,555 acres constitute the area of New York City, and 433,373 acres the area of the outside territory. It reported the estimated population of New York City in 1914 as 5,333,539, and that of the outside territory as 1,923,846,—a total for the district of 7,257,385. It is now much more. The 1918 estimate of the Department of Health's Vital Statistics Bureau was a population of 5,872,143 in New York City. The 1917 Federal census estimate gave Jersey City a population of 312,000; Hoboken, 78,000; Bayonne, 72,000; Elizabeth, 88,000; Newark 419,000. These figures for these as well as other cities towns, boroughs and villages in the New York City Metropolitan District all show increases over the 1914 estimate.

Its Industries

Of the industries in the New York City Metropolitan District, the United States Bureau of the Census Report on manufactures says:

"In 1914 the New York City Metropolitan District had 36,410 manufacturing establishments, which gave employment to an average of 1,031,815 persons during the year, 842,103 being wage earners, and paid out \$711,085,669 in salaries and wages. These establishments manufactured products to the value of \$3,428,223,150 to produce which materials costing \$1,984,842,079 were utilized. The value added by manufacture was \$1,433,381,071. The district

ranked first in 1914 among the metropolitan districts of the United States in the value of its products. It represented 12.5 per cent. of the persons employed, 11.5 per cent. of the capital, and 14.1 per cent. of the value of products reported for the entire country.

"The greater part of the value of the manufactured products of the district was reported by factories within the central city. New York City contains nearly three-fourths (73.5 per cent.) of the estimated population of the district, and contributed more than two-thirds (66.9 per cent.) of the value of products in 1914. The corresponding percentages for 1909 were 73.6 per cent. and 68.3 per cent. respectively, which indicates that the increase in population and in the manufactures of the central city have not kept pace with the growth of the district as a whole. In 1914 the manufacturing establishments of New York City constituted over four-fifths (81.4 per cent.) of all in the district, and gave employment to nearly seven-tenths (69.5) of the wage earners. Outside of New York City, Newark was the leading city within the district both in value of products and in population, its products representing 6.1 per cent. and its population 5.4 per cent. of the total for the metropolitan district."

Harbor and Terminals

The chief entrance to New York City is New York Bay. The Narrows, a passage about five-eighths of a mile wide at its narrowest point, divides it into two spacious parts—the Lower Bay and the Upper Bay. The Lower Bay entrance is about six miles wide. The Upper Bay extends from the Narrows to the Battery.

The main channels in the Lower Bay to and from New York harbor are Ambrose Channel and the Main Ship-Bay-

side-Gedney Channel. Formerly the latter channel was the route used by deep draft vessels. Its width is from 500 to 1,000 feet and it has a depth of 30 feet at mean low water. But Ambrose Channel is now the more important. It was completed April 17, 1914, is about 38,000 feet long and 2,000 feet wide, and has a depth of 40 feet at mean low water. In the inner harbor there are a number of different channels leading to various sections of the port.

The terminals of the larger transatlantic steamship lines are on the Hudson River, especially between Little West Twelfth Street and West Twenty-fifth Street on the New York side. Between Little West Twelfth Street and Twenty-second Street are the Chelsea Piers, built by New York City at a cost of \$24,000,000, and constituting one of the finest steamship terminals in the world. There are seven whole piers and two half piers. It is in this stretch of piers that the International Mercantile Marine, the Cunard Line, the Compagnie General Transatlantique, the White Star Line and other large transatlantic lines are concentrated.

On the New Jersey side of the Hudson River are the terminals of the Holland-American Line and the Scandinavian American Line. Before their seizure by the Government during the war the terminals of the Hamburg-American and North-German Lloyd lines were also there. The New Jersey shore of the Hudson River is, however, occupied largely by railroad terminals with transfer floats and by grain elevators and coal handling plants.

Some lines in the Caribbean Sea trade are on the Manhattan side of the East River, others are at the terminals of the New York Dock Company in South Brooklyn. Lines to Central and South America are located mainly at the New York Dock Company's piers, as are also some lines to the

Orient. Other lines to the Orient, as well as lines to South Africa and Australia have their terminals at the piers of the Bush Terminal Company in South Brooklyn.

It is in South Brooklyn where the bulk of the shipping of exclusively freight vessels in the foreign trade is done. The mass of the freight imported or exported is lightered there to or from the New Jersey shore. The big liners, the terminals of which are in Manhattan, carry passengers as well as freight. Few bulk carriers are loaded or discharged from piers in Manhattan.

There are 13 trunk-line railroads serving the port of New York. Only one has a terminal in Manhattan. Nine have their terminals on the New Jersey side of the harbor, one in the Bronx, one on Staten Island, and one on Long Island. Consequently most of the transferring of freight has to be done by lighters.

The chief terminals of the coastwise steamship lines, the Long Island Sound steamers to New England ports, and the Hudson River boats are on the Manhattan side of the Hudson River.

The Manhattan side of the East River is occupied largely by railroad freight terminals.

There are about 200 steamship companies having vessels sailing from the port of New York, but to give the precise number is difficult because of the constant changes and new organizations that have recently been developing. Approximately there are 249 steamship routes to various European countries; 21 to the West Indies; 11 to Central America; 47 to South America; four to North American ports; 23 to Asia and three to Asia Minor; six to Australasia; one to Hawaii; six to the Philippines; and 25 to Africa. The total number of steamship routes operating to these various places is about

389. This number, however, does not imply distinct steamship companies. In a number of cases the same steamship company has routes to different countries.

Approximately 48 river and coastwise steamship lines operate from New York.

Port charges comprise a list of various charges. Charges against the vessel include pilotage, towage, dockage, loading and discharging, bunkering, dunnage, Port Warden's fees and miscellaneous charges. In charges against the cargo are included lighterage and floatage, elevating and storage.

Improvement Projects

In 1917 the Legislatures of the States of New York and New Jersey created a New York-New Jersey Port and Harbor Development Commission. The purpose was a joint aim on the part of both States to co-ordinate and systematize the port's facilities. The Commission has been engaged in studying all of the various branches of the subject, with the view of making definite recommendations.

In its progress report of April 14, 1919, to the Governors of both States, the Commission outlined the scope of its investigations and stated in its Conclusion:

"The problems of the Port of New York are more serious than is generally realized, even at the Port itself. To the population of the Port they are serious, because if anything less than the most efficient system obtainable is in use this fact must be reflected in prices; and because if any other port can offer a more efficient system it is likely to draw trade from New York. To all New York State and all New Jersey they are serious, because New York is the gateway to and from the interior. If there is congestion at the gateway the interior suffers. . . . To the nation itself the problems are

serious. Foreign trade has established New York as its focal point. . . .”

The Commission declared that the greatest local and national benefit “will come from a scientific development of the whole port, and it is earnestly seeking to evolve a plan for such a development.” Its aim, it reported, was a co-ordinated program of port operation and development that would be a guide for 50 years. Among the specific plans being considered are better railroad facilities connecting with the piers in Manhattan; tunnels or bridges connecting with the railroads in New Jersey; an exterior belt line in New Jersey with a comprehensive system of union freight stations; and the providing of adequate steamship terminals properly related to the railroads.

CHAPTER XXI

The Great Lakes Traffic

THE total area of the Great Lakes is 94,585 square miles. With their connecting waterways they have a total drainage of 187,179 square miles. Combined, the two make a basin area of 281,764 square miles.

At the greatest length and breadth Lake Ontario is 193 miles long and 53 miles broad; Lake Erie is 241 miles long and 57 miles broad; Lake Huron is 206 miles long and 101 miles broad; Lake Michigan is 307 miles long and 118 miles broad; and Lake Superior is 360 miles long and 160 miles broad. Excluding islands, the United States shore line is approximately 2,985 miles. The States bordering the Great Lakes—New York, Pennsylvania, Ohio, Illinois, Indiana, Michigan, Wisconsin and Minnesota—had, in 1918, an estimated population of nearly 42,000,000. The Great Lakes cities such as Chicago, Cleveland, Buffalo, Detroit, Milwaukee, Toledo, Duluth and others have an aggregate population of many millions.

Original Navigation

The first white men on any of the lake waterways were the French navigators who, under Jacques Cartier, sailed, in 1534, up the St. Lawrence River as far as Quebec. In 1615 Champlain's explorations extended as far as Lake Huron on the eastern shore of which he established missionary stations. In 1641 two missionaries, Joques and Rambault, reached St. Mary's Falls, and in 1658 two fur traders reached the west

end of Lake Superior. In 1665 Alonez established missions at St. Mary's Falls. Joliet and Marquette began their explorations from St. Ignace on the Straits of Mackinaw.

The first sailing vessel placed on the Great Lakes was in November, 1678, when La Salle and Father Hennepin set sail in a 10 ton vessel on Lake Ontario at a point near the present city of Kingston, Ontario. In May, 1679, they launched the *Griffin*, the first sailing vessel to navigate the Great Lakes as far as Green Bay. Laden with furs the *Griffin* was lost on the return trip. From 1700 to 1756 the construction and navigation of sailing vessels was chiefly, if not wholly, confined to Lake Ontario. Beginning about 1755 the English commenced to build and navigate sailing vessels on Lakes Erie and Ontario.

Early Commerce

After the American Revolution the commerce of Lake Ontario increased, exceeding that of the other lakes. In 1818 Lake Ontario's fleet consisted of 60 vessels, engaged mainly in transporting furs, fish, salt, lumber and other products to and from settlements and military posts. The first American vessel on Lake Erie was the schooner *Washington* built at Erie in 1797. In 1816 the tonnage of Lake Erie ports was 2,067, and the vessels ranged from 10 to 100 tons, only two vessels, one of 102, the other of 134 tons, exceeding that general maximum.

The first steam vessel navigating the lakes was the *Ontario*, a paddle-wheeler of 240 tons, built in 1817 at Sackett's Harbor, New York. The *Walk In The Water* was the first steamer navigating the lakes above Lake Ontario, and was launched at Black Rock, now a part of Buffalo, in May, 1818. The machinery for the *Walk In The Water* had to be brought

300 miles from Albany in wagons drawn by five to eight horses each. The *Walk In The Water* plied regularly between Black Rock and Detroit. Shortly after there came the steamers *Superior*, *Pioneer* and others.

The schooner *Illinois*, 100 tons, was the first vessel to arrive at Chicago from the lower lakes. "This important event," wrote a chronicler, "occurred July 12, 1834, when she was hauled over the bar. On that occasion all the male inhabitants of the village, including the boys, amounting to nearly 100, assisted in dragging the craft across the bar. Flags were then raised on the schooner, and she sailed up the forks of the river in fine style."

Beginning of Grain Trade

Traffic, at this period, was largely to the west, the vessels carrying a heavy passenger migration and cargoes of flour and other provisions and supplies for the settlements. It was not until 1836 that the first cargo of grain arrived at Buffalo. It consisted of 3,000 bushels brought from Grand River, Michigan, by the brig *John Kenzie*.

From this time onward the grain trade increased gradually to large proportions. The Erie Canal from Albany to Buffalo, begun in 1817 and opened in 1824, supplied a clear route from the Great Lakes to the Atlantic. To overcome natural obstacles between Lakes Ontario and Erie the Dominion Government constructed the Welland Ship Canal from Port Dalhousie, on Lake Ontario, to Port Colborne, on Lake Erie. It was opened in 1833, and subsequently enlarged. Another route to the ocean was made available by the overcoming of a series of obstructions along the St. Lawrence River. At different points between Lake Ontario and Montreal the Dominion Government built the Lachine,

Beauharnais, Cornwall, Farrans Point, Rapide Plat, Galops and other canals. The receipts of grain (not including flour) at Buffalo in 1836 were 543,461 bushels. In 1841 they were 1,852,325 bushels. Grain elevators were first built at Buffalo in 1843, and the grain receipts there by 1851 increased to 11,449,661 bushels; by 1861 to 50,062,646 bushels; and by 1871 to 60,765,357 bushels.

Copper and Iron Discoveries

The navigation of Lake Superior began considerably later than that of the other lakes and its development was much slower.

The first American vessel launched upon Lake Superior was the *John Jacob Astor*, in 1835. Other vessels were subsequently built by the American Fur Company owned by Astor. In about the years 1833 and 1834 copper was discovered on the shores of Lake Superior. This gave an impetus to the building of vessels on Lake Superior and its navigation. Late in 1845 the *Independence*, a steam vessel of 260 tons, was launched on Lake Superior. Later came the development of the vast iron ore deposits in the Vermillion and other ranges. To overcome the rapids in St. Mary's River at Sault Ste. Marie, a private company began constructing, in 1853, the St. Mary's Falls Ship Canal. This canal, connecting Lakes Superior and Huron, was opened to navigation in 1855. It was later improved by the United States Government. There is also a parallel St. Mary's Falls Canal.

Growth of Shipping

In 1849 the total tonnage of American commercial shipping (not including canal boats and barges) on the Great

Lakes was 161, 832 tons, composed of 60,752 tons in steam vessels and 101,080 tons in sailing vessels, the whole valued at \$7,868,000. In 1862 the Great Lakes American shipping comprised 350 steam vessels of 125,620 tons, valued at \$5,482,900, and 1,152 sailing vessels of 257,689 tons valued at \$6,379,500, making then a total tonnage (not including canal boats and barges) of 383,309 with a total value of \$11,862,450. It showed since 1849 an increase in tonnage of 136.81 per cent. and of 50.77 per cent. in value. On June 30, 1885, the Great Lakes American merchant fleet was 2,497 vessels with a tonnage of 648,988. There were, besides, many canal boats and barges.

Larger vessels were constantly put into service. In 1859 the largest steamer on the lakes was 980 tons, and the average 700 tons net register. In 1886 there were 21 steamers having a net registered tonnage exceeding 1,500 each, and in 1891 there were 126 steamers of that size. Steel vessels supplanted wooden at this period. On December 1, 1886, there were on the Great Lakes only six American steel vessels with a tonnage of 6,459, of the value of \$694,000. On the same date in 1891 there were 89 American steel vessels, all of which except 19 were steamers, with a tonnage of 127,624, valued at \$14,502,500. In addition, there was a large tonnage of wooden steam vessels and of sailing vessels, canal boats and barges, the whole amounting in 1891 to more than 1,000,000 tons of American vessels.

By 1900 the documented Great Lakes American commercial fleet increased to 3,167 vessels of 1,565,587 tons, of which 832 were sailing vessels and 1,739 steam vessels. The remainder were canal boats and barges. In 1910 the documented Great Lakes American merchant fleet totalled 3,273 vessels of 2,895,102 tons, comprising 362 sailing vessels, 2,107

steam vessels, and the rest canal boats and barges. In 1903 and 1915 New York State voted large bond issues for the enlargement and improvement of the Erie Canal. Widened and deepened so as to permit the passage of larger vessels, the new canal, now called the Erie Barge Canal, was opened for traffic for the entire distance between Troy and Buffalo on May 15, 1918.

On June 30, 1918, the Great Lakes documented American merchant fleet totalled 2,939 vessels of 2,797,503 tons, of which 133 were sailing vessels, 2,295 were steam vessels, and the remainder canal boats and barges. During the World War, when Great Lakes steel vessels were shifted to ocean service, the Great Lakes steel commercial fleet temporarily lost about 100,000 tons of steam vessels.

On June 30, 1919, the documented American merchant fleet on the Great Lakes aggregated 3,043 vessels of 3,023,762 tons; it comprised 1,541 steam vessels of 2,721,079 tons; 125 sailing vessels of 151,383 tons; 839 gas vessels of 10,473 tons; 103 canal boats of 11,525 tons; and 435 barges of 129,302 tons.

Progress of Shipbuilding

Shipbuilding had for many decades been an established industry in American ports on the Great Lakes. In the fiscal year 1857 there had been built 51,498 tons. During the next three decades the yearly output varied, sinking as low as 6,180 tons built in 1860 and as high as 92,448 tons built in 1873, and 101,103 tons in 1888. In 1889 a total of 107,080 tons, in 1890 a total of 108,526 tons, and in 1891 a total of 111,856 tons were built in American cities on the Great Lakes. For a few years after that the output fell, rose to 108,782 tons in 1896 and 116,937 in 1897, and again decreased until 1900.

From that year until 1910 there was great activity in shipbuilding in Great Lakes American ports, as shown by these returns for fiscal years:

AMERICAN MERCHANT-VESSELS BUILT ON THE GREAT LAKES

<i>Year</i>	<i>Number</i>	<i>Tons</i>
1900	125	130,611
1901	175	169,085
1902	133	168,873
1903	123	136,844
1904	119	159,433
1905	101	93,123
1906	204	265,271
1907	177	244,291
1908	216	341,165
1909	174	100,402
1910	281	168,751

From 1911 to 1916 the production of vessels decreased. From 94,000 tons in 1911 and 90,000 tons in each of the years 1912 and 1913, the output went down to 16,467 tons in 1915 and 44,691 tons in 1916. In 1917 there was a great renewal of activity. American shipyards on Great Lakes ports produced 147 vessels of 139,336 tons in the fiscal year 1917, and 168 vessels of 215,022 tons in the fiscal year 1918.

From 1909 to 1918 (fiscal years) 885,908 tons of steel steam vessels were built in Great Lake American ports. Cleveland shipyards led with 399,985 tons, and Detroit yards came next with 308,402 tons. The remaining steel tonnage came from yards in Toledo, Milwaukee, Duluth, Port Huron, Chicago, Buffalo and other cities. The largest shipbuilding concerns on the Great Lakes are the American Shipbuilding Company which has yards at Cleveland, Buffalo, Chicago, Lorain, Wyandotte and Superior, and the Great Lakes Engineering Works which has yards at Ashtabula, Ohio, and

at Ecorse, Mich. The Toledo Shipbuilding Company is another large concern. Some of the other steel shipbuilding companies are the Saginaw Shipbuilding Company; the McDougall Duluth Company of Duluth; the Globe Shipbuilding Company of Superior; the Northwest Engineering Works of Green Bay, Wis.; Whitney Bros. of Superior; and the Manitowoc Shipbuilding Company of Manitowoc, Wis. The steel shipbuilding companies have a total of 93 ways, of which the American Shipbuilding Company has 35. There are also a number of wooden shipbuilding plants.

During the fiscal year 1919 American shipbuilding on the Great Lakes attained unprecedented proportions. The United States Commissioner of Navigation reported that in that fiscal year there were built and documented on the Great Lakes 222 steam vessels of 494,917 tons. In addition American shipbuilding plants on the Great Lakes constructed in that year 47 gas vessels of 626 tons; 11 canal boats of 2,211 tons; and 37 barges of 9,418 tons. The total construction record in the fiscal year 1919 was, therefore, 317 vessels of 507,172 tons.

As for shipbuilding on the Canadian side it was estimated in February, 1919, that fully 40,000 tons of the Dominion Government's steel shipbuilding program were being built on the Great Lakes.

Volume of Freight Traffic

Freight traffic on the Great Lakes has grown to enormous proportions. Statistics of the passage of vessels through the Sault Ste. Marie Canals give some idea of its extent. In the navigable season of 1895 a total of 15,062,580 short tons of freight, of which 70 per cent. was carried by steamers, went through these canals. Of this total only 3.75 per cent.

was carried by Canadian vessels. In the season of 1918 the freight carried through the Sault Ste. Marie Canals was 85,680,327 short tons of which 96 per cent. was carried in steamers, and only six per cent. of the whole was carried in Canadian vessels.

Iron Ore Shipments

In 1856 the first shipment of Lake Superior ore was made. It was only 5,000 gross tons. The shipments increased gradually until in the season of 1866 they were 87,943 gross tons. In 1868 they reached 131,707 gross tons, and in 1873 were more than a million and an eighth gross tons. The transportation of iron ore became the largest single item in the Great Lakes traffic. These inland waters supplied a cheap route to the furnaces in Pennsylvania, Ohio and Illinois. By 1885 the shipments of iron ore were very large.

In the season of 1906 shipments of iron ore by lake reached 37,513,589 gross tons; in 1907 they totalled 41,290,709 gross tons; fell to 25,427,094 gross tons in 1908; and increased in 1909 to 41,683,599 gross tons, and in 1910 to 42,628,758 gross tons. In the seasons of 1911 and 1914 the shipments were about 32,000,000 gross tons each; 49,070,478 gross tons in the season of 1913, and 46,318,804 gross tons in the season of 1915. The record year of iron ore shipments was the season of 1916 when 64,734,198 gross tons were shipped by lake. In the season of 1917 iron ore shipments by lake were 62,498,901 gross tons, and in 1918 they were 61,156,732 gross tons.

Grain and Flour

The volume of shipments of grain and flour (mainly grain) by the Great Lakes may be judged by the receipts at Buffalo. Shipments by lake to Buffalo were 214,806,812 bushels in

1913; 185,061,619 bushels in 1914; and 250,152,948 bushels in 1915. In 1916 they were 208,727,132 bushels; in the next year 163,031,322 bushels; and in 1918 they were 153,409,567 bushels. Other considerable quantities of flour and grain were transported by the Great Lakes to other lake ports.

In addition, there are large shipments of grain to Canadian ports. The 1918 *Canada Year Book*, published by the Dominion Government, states that the shipments of grain (chiefly wheat) on Canadian vessels from Fort William and Port Arthur during the navigable seasons of 1917 and 1918 were: In 1917 a total of 198,455,258 bushels, of which 101,012,536 bushels went to Canadian ports, and 97,422,722 bushels to American ports. In 1918 the total was 51,215,097 bushels, of which 50,830,272 bushels went to Canadian ports and 384,825 bushels to American ports. No explanation is given of the reason for the great decrease from 1917 to 1918.

Coal Movement

The shipment of anthracite and bituminous coal supplies the return cargo from eastern ports on the Great Lakes. Coal shipments rank next in volume to those of iron ore. Were it not for coal shipments, vessels carrying iron ore, grain and lumber to the lower lake ports would return largely empty. Lacking coal resources of its own, the great territory west and north of Lake Michigan and Superior is able by the lake route to obtain ample supplies at cheap transportation rates both for domestic and manufacturing purposes. The bulk of the anthracite coal and some bituminous coal are shipped from Buffalo. The main movement of bituminous coal is from Cleveland and Toledo, but considerable shipments are also freighted from other Lake Erie ports.

Through the Sault Ste. Marie Canals there passed in the

1917 navigable season 15,763,654 short tons of soft coal, and 2,211,050 short tons of hard coal, and in the 1918 navigable season 15,770,560 short tons of soft coal, and more than 2,000,000 short tons of hard coal. But these were only part of the total shipments of coal on the Great Lakes. The total coal shipments on the Great Lakes in the 1917 season were 31,518,742 net tons of which 26,828,759 net tons were bituminous, and in the 1918 season 32,102,022 net tons, of which 28,153,317 net tons were bituminous.

These large shipments were not due to war conditions. The coal movement, including both anthracite and bituminous, on the Great Lakes had increased from a total of 14,401,199 net tons in the season of 1905 to a total of 26,478,068 net tons in the 1910 season. In 1911 the total for the season amounted to 25,700,104 net tons, and in the season of 1912 to a total of 27,539,741 net tons. In the season of the normal year of 1913 the Great Lakes coal movement was 33,362,379 net tons, of which 28,328,683 net tons were bituminous. The total of both hard and soft coal in the season of 1914 was 27,280,228 net tons; in the 1915 season 26,220,000 net tons, and in the 1916 season 28,792,800 net tons.

The westward traffic movement on the Great Lakes also includes manufactured iron and steel, salt, oil, stone and general merchandise, the whole, however, small compared to the value and volume of the coal freight. Passenger traffic is heavy.

The new Welland Ship Canal, which has been in process of construction by the Dominion Government, is 25 miles long and will have a uniform depth of 25 feet, with 30 feet on the sills.

CHAPTER XXII

American Registry Laws

REGISTRY of vessels: All vessels of five tons net burden and more trading at any port of the United States under the flag of this country must be documented. But documentation is not required for canal boats, barges, lighters and similiar craft which have neither sails nor self propelling power and which are employed wholly in harbors or upon canals or other internal waters. Documentation for these craft is required only when they carry passengers or are engaged in the trade with contiguous foreign countries.

The United States laws provide for the granting of these three classes of documents: Certificates of registry for vessels in foreign trade and in trade with the United States insular possessions, excepting Hawaii and Porto Rico, and for vessels in the whale fisheries; enrollment and license for vessels of 20 tons burden and upward exclusively engaged in the coasting, inland and fishery trades; and license which is necessary for all vessels of between five and 20 tons burden engaged in the coasting, inland and fishery trades.

The right of flying the United States flag and of operating under the American flag in foreign waters without the necessity of documentation has always been vested in vessels owned by American citizens. From the very establishment of our Government, the right of American citizens to own vessels built abroad has been affirmed.

To promote domestic shipbuilding, however, Congress early passed legislation providing that only documented ships

could engage in the trade of the United States, and this policy has remained fixed in law. Consequently, undocumented vessels engaging in any form of trade with American ports were made subject to prohibitory penalties.

The law leaves it optional with the owner of a vessel as to the securing of registry. The statute confines itself to providing that vessels not registered and duly qualified according to law shall not be regarded as vessels of the United States and shall not be entitled to the benefits and privileges of United States vessels.

Although registered vessels are allowed to engage in the coasting trade without being licensed and enrolled, they seldom do so, because of the higher pilotage fees that registered vessels have to pay. A statute passed by Congress in 1864 (Rev. Stat., 4318) authorized enrolled and licensed vessels "navigating the waters of the northern, northeastern and northwestern frontiers, otherwise than by sea" to engage in the coasting or foreign trade without obtaining a certificate of registry.

Qualifications of Registry

Registration under the American flag is restricted to vessels owned entirely by American citizens. But citizens of foreign countries may own stock in corporations chartered by the United States or any of the States.

Registrations must be made (Rev. Stat. 4141) by the collector of customs in the customs district embracing the port to which the vessel belongs at the time of its registry. The Supreme Court of the United States has held (*Southern Pac. Co. v. Commonwealth of Ky.* 22 U.S., 63) that a registry attempted at any other place because, for instance, of the desire to obtain lower State or local taxes, is invalid.

When registry is applied for, certain formalities are required. There must be submitted (Rev. Stat. 4147) a carpenter's (shipbuilder's) certificate attesting that the vessel was built under his direction and giving descriptive details. The vessel's owner or master must make an oath (Rev. Stat. 4142) as to his nationality and the nationality of the owner or owners. In case of an owning corporation, the president or some other accredited officer must swear (Rev. Stat. 4139, amended by act of June 24, 1902), to the ownership of the vessel, without, however, being called upon to specify the names of those comprising the company. When all requirements have been properly complied with and duly recorded the collector of the district to which the vessel belongs issues a certificate of registration. In this certificate is set forth a detailed statement of the vessel's ownership, measurement and construction. The certificate can be used only for the vessel to which it applies.

Previous to the passage of the Panama Canal act of August 24, 1912, and of the ship registry act of August 18, 1914, only American-built ships were admitted to registry. There were only a few exceptions to this rule. One exception was vessels captured in war by the United States citizens and lawfully condemned as prizes. The second was in the case of two foreign-built vessels belonging to the American Line which were granted registry on condition that two others of the same size and speed be built in American yards and all four operated as a fast transatlantic mail line. The third exception was in the case of vessels wrecked on the coasts of the United States, and bought by American citizens and repaired in an American shipyard, the securing of the registry being conditional upon the further fact that the cost of repairs should be at least three times the value of the vessel.

Our Present Registry Policy

As stated in a prior chapter, the Panama Canal act established a distinctly new maritime policy by admitting to registry any foreign-built vessel more than five years old, if owned wholly by American citizens or by American chartered and directed corporations. The ship registry act of 1914 removed this age limit. This act, further, empowered the President in his discretion, whenever the needs of foreign commerce demanded such action, to suspend the law's provisions requiring all watch officers of registered American vessels to be citizens of the United States. The President was likewise empowered to suspend the statutory provisions requiring survey, inspection, and measurement by Government officers of foreign-built vessels admitted to American registry under this act.

The ship registry act was followed by an Executive order issued on September 4, 1914, suspending for two years the survey, inspection and measurement requirements and allowing all foreign-built vessels thus admitted to registry to retain their watch officers, irrespective of citizenship, for seven years, provided that if after a period of two years there was any vacancy a citizen of the United States should be appointed.

Existing Transfer Acts

To facilitate the transfer of American-owned vessels from foreign to United States registry, Congress passed an act on March 4, 1915. This law repealed the statute imposing tonnage duties of 50 cents per ton and light money of 50 cents per ton on vessels owned by United States citizens but which were not vessels of the United States. It also repealed that

part of the tariff act of October 3, 1913, which placed a discriminatory duty of 10 per cent. ad valorem on goods imported in such vessels. Retroactive in its scope, the act of March 4, 1915, provided for the refund of all tonnage, light money and discriminatory duties paid since the enactment of the law of August 18, 1914.

Although the act of 1914 was not passed until after the war in Europe had begun, the essentials had been recommended by the Secretary of Commerce before the war and a bill had been introduced in Congress. The object was to do away with obsolete laws which had forced American shipping interests to use foreign flags and registers for vessels which were really American property.

The act of March 4, 1915, also provided that United States consular officers or other authorized persons were empowered to issue provisional certificates of registry to vessels abroad which vessels had been bought by United States citizens or corporations. Under this provisional certificate the vessel is endowed with full American privileges, and the certificate is valid for six months from its issue or until 10 days after the vessel's arrival at a United States port. Then the vessel becomes subject to American laws regarding officers, inspection and measurement, as amended by the ship-registry act of August 18, 1914.

Measurement and Tonnage Laws

MEASUREMENT of vessels: On May 6, 1864, an act was passed by Congress practically adopting the gross tonnage measurement system established in Great Britain by the merchant shipping act of 1854. The act of 1864 was amended by the act of February 28, 1865, which provided (Rev. Stat. 4151) that no part of any vessel used for cabins or staterooms, and constructed entirely above the first deck which was not a deck to the hull, should be required to be measured or registered for tonnage. This amendment was drafted particularly for coastwise, lake and river steamers, but it was also applied to ocean steamers.

Tonnage Statutes

According to the interpretation made by the United States Customs Regulations of 1908 (Articles 71-87) this amendment "was designed merely to exclude cabins and staterooms above the promenade deck of the steamers of the sea-coast and lakes, or above a boiler deck as used on the western rivers. It does not have the effect of exempting from admeasurement any closed-in place even if so situated, if used for cargo and stores."

The act of 1864 provided only for the ascertainment of gross tonnage, and until 1882 this formed the basis upon which tonnage taxes and ship charges were levied at American ports. In 1882 the United States measurement act adopted what was called the Danube rule which, in the case of most ships, made a smaller allowance for propelling power, including fuel, than did the British act.

The act of 1882 was superseded by the Frye Measurement Act of March 2, 1905, which adopted for the United States the British rules for measuring propelling power, and which in other respects brought our measurement laws into accord with prevalent maritime practice. On February 6, 1909, another act dealing with tonnage was passed. Under present United States laws, regulations and interpretations, the tonnage basis for charges on an American ship does not exceed that on a foreign ship, and in some cases is materially less.

Rules of Measurement

The United States gross tonnage rules include in the measurement the entire space under the tonnage deck and between the tonnage and upper decks; the space occupied by hatchways in excess of one-half of one per cent. of the vessel's gross tonnage exclusive of the hatchways tonnage; and any permanent closed-in space on the upper deck available for cargo or stores or for the berthing or accomodation of passengers or crew. Under the law of 1865, however, as has been stated, certain passenger decks are not subject to gross tonnage measurements.

Nine different spaces are exempt from gross tonnage measurement. They are: (1) Double-bottom water-ballast spaces not available for stores, or hull, and the spaces between the frames and the floor beams; (2) spaces under the shelter deck and in the poop, forecastle and bridge, when not permanently closed in; (3) passenger accommodations in tiers of superstructures over the first tier above the upper deck; (4) hatchways up to one-half of one per cent. of the vessel's gross tonnage; (5) galleys, bakeries, toilets, and bathhouses above deck; (6) spaces above deck occupied by

ship's machinery or for the working of the vessel; (7) light, air and funnel space over the engine and boiler room and above the upper deck or the shelter deck; (8) domes and skylights, companion ways (except portions used as smoking room) and ladders and stairways in exempted places; (9) open spaces occupied by deck loads.

American Tonnage Rates

Tonnage Duties: These are a general charge or tax on shipping, and are closely related to the measurement of vessels. Practically all countries levy them.

In the United States (Rev. Stats. 427, amended by sec. 36, act of August 5, 1909), a tonnage tax at the rate of two or six cents for each net ton is levied upon every vessel engaged in trade upon arrival by sea from a foreign port. Vessels in distress are exempted.

The two cent a ton rate applies to all vessels arriving from any foreign port in North America, Newfoundland, Central America, the West Indies, the Bahamas and the Bermudas, or the coast of South America bordering on the Caribbean Sea. The six-cent a ton covers all vessels arriving from any other foreign port. The tonnage duty is not levied on more than five entries at the same rate during any one year, the tonnage year beginning with the date of the first payment and ending on the day preceding the corresponding day in the following year. United States tonnage rates are about the same as the light dues imposed in Great Britain, and are considerably lower than those levied in the ports of Continental Europe and elsewhere. There are various exemptions made by United States laws from the payment of tonnage duties. These largely affect the fisheries and the Great Lakes vessels.

New Load-Line Legislation

Loading of vessels: Hitherto, all the great maritime countries except the United States and Japan have had load-line laws. United States laws lacked any distinct provision. By marking the depth to which ships may be loaded safely, the load-line adds to the safety of a vessel at sea. The absence of load-line laws has had a prejudicial effect in the placing of marine insurance on American ships and has admitted of discrimination against them in foreign ports. In October, 1919, the House of Representatives passed a load-line bill which also provided the administrative machinery for the fixing of load lines on cargo ships. The bill provides that the Secretary of Commerce shall determine standards, measurement and other rules. The bill is drafted along the lines of British legislation.

CHAPTER XXIV

Ship Safety Laws

SEAWORTHINESS: The United States statutes on this subject are mainly of a general character. They provide that no vessel in an unseaworthy condition shall leave any port in the United States.

Section 11 of the law of December 21, 1898, imposes penalties upon any person who knowingly sends out an unseaworthy ship and endangers life. Different sections of the Revised Statutes require official inspection of iron or steel plates, boilers and other appurtenances used in construction. Annual inspections are also prescribed of hulls, boilers and machinery of all steam vessels, hulls of sailing vessels of more than 700 tons burden carrying passengers for hire, and all other vessels of more than 100 tons burden similarly carrying passengers. Regular inspections of other equipment are also prescribed.

All sea-going steamers and those on the Great Lakes carrying passengers are required by United States laws to have not less than three water-tight bulkheads, and the stout way in which these bulkheads must be built is clearly specified. An exception is made in the case of certain coastwise, harbor or lake passenger steamships which do not operate more than 15 miles from the mouth of bays or harbors. The 1918 *General Rules and Regulations Prescribed By the Board of Supervising Inspectors* set forth in detail precise regulations. These require a water-tight collision bulkhead and two or more water-tight bulkheads as may be necessary for every sea-

going steam vessel. Wooden steamers carrying passengers and the cargoes of which are restricted to lumber are required to have water-tight collision bulkheads and two water-tight bulkheads. All sailing vessels of more than 700 tons, carrying passengers for hire, are required to have a water-tight collision bulkhead.

Requirements for Life Saving

Life-Saving Equipment: The regulation of this was formerly embodied in the laws contained in sections 4481, 4482 and 4488 of the United States Revised Statutes. In 1913-1914 there was held at London an International Conference on Safety of Life at Sea. Section 14 of the act, popularly called the Seamen's Act, passed by Congress on March 4, 1915, amended section 4488 by incorporating practically all of this Conference's recommendations.

Existing United States law requires two main classes of lifeboats. One class is entirely rigid, the other having partly collapsible sides. Each of these classes is divided into three subclasses of a different order of construction, the technical details of which, as well as of the life rafts, are minutely prescribed. The maximum number of lifeboats and life rafts carried by a passenger steamer is dependent upon the number of persons on board. The maximum number of passengers and the minimum number of the crew that a vessel is allowed to carry are determined by the Steamboat Inspection Service. All cargo steamships operating on ocean routes or on the Great Lakes must have, at all seasons, lifeboats sufficient for every person on board.

In regard to passenger vessels the law makes a distinction between those built prior to July 1, 1915, and those built since that date.

The provisions applying to passenger steamships built before that date are: All ocean passenger steamships operating more than 20 nautical miles offshore must have, at all seasons, an adequate number of lifeboats; if the minimum number attached to davits is not enough, they must provide additional lifeboats so as to have enough for 75 per cent. of all persons on board, and sufficient lifeboats or pontoon rafts for the remainder. All ocean passenger steamships operating less than 20 nautical miles offshore, are required to have, from September 15 to May 15, lifeboats for at least 75 per cent. of all persons on board, and during the other months when life boats or pontoon rafts are required for only 70 per cent. of all persons on board, the lifeboats must have the capacity to accommodate at least 50 per cent. of the 70 per cent. The remainder may be provided for by collapsible life boats or rafts.

For Great Lakes passenger steamships operating on routes more than three miles offshore, the law requires, in the inclement season, lifeboats for at least 75 per cent. of all persons on board and life-saving equipment for all. During the other months lifeboats and rafts are required for not more than 50 per cent. of all persons on board. Of this 50 per cent. accommodation, not less than two-fifths shall be lifeboats, and three-fifths may be collapsible life boats or rafts.

In the case of all vessels built since July 1, 1915, whether for ocean operating or Great Lakes service on routes more than three miles offshore, the law requires that they shall be built to carry and shall carry lifeboats and life rafts to accommodate all persons on board. Not more than 25 per cent. of this equipment may be in pontoon life rafts or collapsible lifeboats.

Sec. 14 of the act of March 4, 1915, makes these require-

ments: Not more than one-half of the pontoon life rafts may carry more than 15 persons. Every lifeboat and raft carrying more than 15 persons must be under the charge of a licensed officer or an able seaman. Every lifeboat and pontoon raft must have a specified number of certificated lifeboat men, the number prescribed depending upon the capacity of the boat or raft. The 1915 act defines a certificated lifeboat man as any member of the crew who, after having been trained in lifeboat operations, is given a certificate of efficiency issued under the authority of the Secretary of Commerce.

Provisions for Inspection

Inspection of Vessels: The laws mainly dealing with this are sections 4417 and 4418 of the United States Revised Statutes, amended by the act of March 3, 1905.

Inspections are made by the local inspectors of the Steamboat Inspection Service. They must be made at least once a year. The inspection covers hulls, accommodations for passengers and crew, seaworthiness and general condition, boilers and appurtenances, life boats, fire pumps, fire extinguishers, hose, life preservers and other equipment, character of cargo, manning of vessels and other matters. The United States Steamboat Inspection Service comprises one Supervising Inspector General, a staff of supervising inspectors and a large corps of local inspectors. At least once a year the Supervising Inspector General and the supervising inspectors meet as a board, and, subject to the approval of the Secretary of Commerce, decide as to what changes may be needed in regulations to carry out the laws effectively. The regulations are published in pamphlet form copies of which are available to all who may be interested.

Navigating Staff and Seamen

Officers and Crew: The act of December 31, 1792, required all watch officers, including pilots, to be American citizens. The act of May 28, 1896, (sec. 1) defined the word officer as including the chief engineer and each assistant engineer in charge of a watch on steam vessels, and specified that only a native-born or fully naturalized citizen could become an officer. As already stated, the ship registry act of August 18, 1914, caused a suspension of these requirements in the case of foreign-built ships admitted to American registry.

The number of officers on American vessels is determined by the local inspectors of the Steamboat Inspection Service. There must be enough officers (Rev. Stat. 4463) to make the vessel safe for navigation.

The orders of the inspectors, however, are subject to section 2 of the act of March 3, 1913. This says that every machinery-propelled vessel of 1,000 gross tons and more must carry at least three licensed mates serving in three watches. But, further says this act, if the vessel's voyage is less than 400 miles, only two licensed mates are necessary. For a machinery propelled vessel of 100 and less than 200 gross tons only one licensed mate is required, unless the voyage takes more than 24 hours, when two licensed mates must be provided.

The Board of Supervising Inspectors prescribes the qualifications necessary to obtain a license as master, chief mate and for other grades of officers of all steam vessels and of sailing ships of more than 700 gross tons. Fitness is determined by examinations which vary according to the nature of the service. Licenses are issued for a five-year term, subject to suspension and revocation if bad character or inefficiency is proved.

No licensed officer on any ocean or coastwise vessel can be lawfully called upon (sec. 3, act of March 3, 1913), to do more than 12 hours duty a day at sea except on occasions of great emergency. When the vessel is in port licensed officers cannot be called upon to work more than nine hours a day.

As to the nationality of the crew, United States laws in general contain no requirements. Under the provision of the ocean mail act of 1891 it was specified, however, that steamers having ocean mail contracts were required, during their first two years of operation under those contracts, to have one-fourth of their crews citizens of the United States; during the next three years, one third; and during the balance of the contract period, at least one half.

The Crew's Qualifications

The Act of March 4, 1915, was the first American law to prescribe definite requirements and standards for the crew's qualifications.

Section 13 of that act prescribes them. To qualify as an able seaman a sailor must be at least 19 years old. All members of the crew must be examined as to general physical condition, eyesight and hearing. Before qualifying and being rated as an able seaman on a sea-going vessel a sailor, it is required, should have had three years' service on deck at sea or on the Great Lakes or on smaller waters, or one year's experience of the same kind, supplemented in this case by an oral examination test as to knowledge of seamanship duties. But the number of one-year men on any vessel is limited to one-fourth of the quota of able seamen. No one can qualify as an able seaman on the Great Lakes, or the smaller lakes, bays and sounds, without having served at least 18 months on deck at sea or on the Great Lakes or the smaller lakes and the

bays and sounds. It was this act also which decreed that not less than 75 per cent. of the crew of any vessel of 100 tons and more, except those exclusively navigating rivers and the smaller lakes, must be able to understand any order given by the vessel's officers. Recently a bill was passed by one branch of Congress authorizing the granting of an able seaman's certificate to any citizen who, after having been graduated from any training school of the Shipping Board, shall have served a year at sea or on the Great Lakes.

No United States law exists definitely fixing the number of a vessel's crew. The minimum number is determined under power given by Rev. Stat. 4463, and also the acts of April 2, 1908, and March 3, 1913, by the Steamboat Inspection Service local inspectors. The act of March 4, 1915, additionally (as already pointed out) specifies the proportion of able seamen to life boats and rafts. It further provided (sec. 13) that after the passage of the act the percentage of able seamen on a vessel was to increase yearly, until after the fourth year from the act's passage, 65 per cent. of the deck crew should be composed of those having the rating of able seamen.

CHAPTER XXV

Laws Regarding the Crew

NO ONE shall be carried to sea as a member of the crew of a vessel leaving the United States for any foreign port who has not before beginning the voyage signed an agreement in writing or in print with the vessel's master. This is a requirement of United States law. These, however, except vessels in trade between the United States and British North American possessions, the West Indies and Mexico. Any vessel of 75 tons or more, bound from an Atlantic to a Pacific port, or vice versa, is also excepted from compliance.

Every agreement, save such as are otherwise specially provided for, must be signed by each seaman before a United States shipping commissioner and must contain certain definite articles.

Shipping Articles

These (Rev. Stat. 4511) must describe the nature and probable duration of the voyage and the port or country at which it is to terminate. The articles, according to the same statute, must also give the number of the crew, a description of their respective employments, the capacity in which each seaman is to serve, stipulated hours of labor and wages, and give a scale of the provisions for each seaman during the voyage. The articles of agreement (sec. 19, act of March 3, 1897, and sec. 10, act of February 14, 1903), include assent to any regulations sanctioned by Congress or authorized by the Secretary of Commerce concerning conduct on board and

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finer, short allowances of provisions or other lawful punishments for misconduct. The articles of agreement (Rev. Stat. 4512) must be made out in duplicate, the shipping commissioner retaining one copy, the other going to the vessel's master. Every master (or captain) engaging seamen in a foreign port in which there is a United States consular officer or commercial agent must first obtain (Rev. Stat. 4517) the sanction of that official and must engage seamen in his presence.

Subsistence on Ship

Under United States law an enumerated kind and quality of provisions must be supplied to the crews of all vessels except fishing and whaling vessels and yachts. A copy of this minimum scale of provisions must (Rev. Stat. 4612, amended by sec. 23, act of December 21, 1898, and sec. 10, act of March 4, 1915), be posted conspicuously in each vessel's galley and forecabin. Certain specified foods may lawfully be substituted. When the vessel is in port, fresh meat, vegetables and additionally fruit must, if obtainable, be provided for the crew's diet.

If it be proved that on a voyage the captain wilfully supplied bad food or water, he is liable, under section 4565 of the Revised Statutes, to a penalty of not more than \$100 in the case of each complaint. If also, without good reason, the quantity of a sailor's allowance of food is reduced and the quality bad, the law (Rev. Stat. 4568 as amended by the act of December 21, 1898), allows him damages as addition to wages. He can recover \$1 a day for bad food, and from 50 cents to \$1 a day for insufficient quantity, the amount of damages dependent upon the amount of reduction specified in the law as grounds for damages.

Hours of Labor

Before the passage of the Act of March 4, 1915, the United States had no statute dealing with the crew's hours of labor. On sea-going vessels the practice had long been to divide the deck crew into two watches and the engine crew into three. Some but not all Great Lakes vessels did the same.

Section 2 of the 1915 law made this apportionment compulsory on all merchant vessels of more than 100 gross tons, excluding those on lakes, rivers, bays, harbors or sounds. The law prohibits the shipping of seamen to work alternately in the fire room and on deck. Likewise, those shipped for deck service are not allowed to work in the fireroom. But if the vessel is in danger or in the event of some other emergency the captain can give to the crew whatever orders the situation demands. Furthermore the captain can order any part or all of the crew to take part in fire, lifeboat and other drills. The law states (section 2, act of March 4, 1915), that when an American vessel is safely in a harbor a seaman's day's work is nine hours, including the anchor watch. On Sundays and five specified holidays no seaman is required to do any unnecessary work while the vessel is in port. But this provision, further says the act of March 4, 1915, does not stand in the way of preparations for the vessel's departure on regular schedule or when ready to leave.

Crew's Living Quarters

The crew's quarters have been increased by successive legislation.

The act of 1897, applying to sea-going vessels, required sleeping quarters for each seaman or apprentice on a steam vessel to be at least 72 cubic feet, with a floor area of at least

12 square feet, and on sea-going sailing ships at least 100 cubic feet and a floor area of not less than 16 square feet, for each seaman or apprentice. The act of March 4, 1915, (sec. 6) increased the sleeping space on both new steam and sailing ships to 120 cubic feet and 16 square feet of floor. This act applies to all United States merchant vessels, including those operating on the Great Lakes and on the smaller lakes, bays and sounds. Only yachts, pilot boats or vessels of less than 100 tons register are exempted.

The 1915 act also contained a new feature in the provision that each seaman must have a separate berth, and forbidding the placing of more than one berth over the other. Sleeping quarters (act of March 3, 1897, reenacted March 4, 1915), must be properly constructed, ventilated, drained, lighted and heated.

Another new feature in the 1915 act (sec. 6) was that requiring all merchant vessels built after the act's passage and having more than 10 men on deck, to have at least one light, clean and properly heated and ventilated washing place for the deck crew. If the fire-room and engine-room crew exceeded 10, they were to have an additional washing room large enough to accomodate at least one-sixth of the men at the same time, the equipment to include hot and cold water and shower baths.

Hospital accommodations are still another new feature required by United States law (sec. 6, act of March 4, 1915), on all American merchant vessels which ordinarily make voyages of more than three days' duration, and which carry more than 12 seamen. This compartment must be isolated and must have at least one bunk for every 12 seamen in the crew, but with the proviso that not more than six bunks shall be required in any case.

Wage Protection

Wages are fully protected by the United States laws. The master or owner of a coasting vessel is required to pay every seaman his wages within two days after the conclusion of the shipping agreement or at the time the seaman is discharged, whichever first happens (Rev. Stat. 4529, amended by sec. 4, act of Dec. 21, 1898, sec. 4 act of June 28, 1906, and sec. 3 act of March 4, 1915).

In the case of vessels making foreign voyages or from an Atlantic to a Pacific port or vice versa, wages, according to the same statutes, must be paid within 24 hours after the cargo has been unloaded or within four days after the seaman has been discharged, whichever takes place first. In all cases, these statutes further declare, the seaman is entitled to be paid at the time of his discharge a sum equal to one-third of the balance of wages then due him.

Under section four of the act of March 4, 1915, no seaman can in any manner waive the privilege of demanding, at any port of cargo loading or discharge, one-half of the wages due him. The act limited the exercise of this privilege to once in every five days, and expressly extended it to the seamen of foreign vessels in United States harbors. The United States statutes contain no reference to wage payment for over-time work.

It is unlawful (sec. 24, act of December 21, 1898, amended by act of April 26, 1904, section 4, act of June 28, 1906, and section 11, act of March 4, 1915), to pay wages in advance of earning to any seaman, or to pay advance wages or to make any order or note or other evidence of indebtedness for the same to any other person. The payment to any person for the shipment of seamen when payment is deducted from wages

is also prohibited by the same laws. Should advance wages or allotments be paid, the vessel's master or owner is not relieved (sec. 24, act of December 21, 1898, amended by act of April 26, 1904, section 4 act of June 28, 1906, and sec. 11, act of March 4, 1915), from the payment of wages in full after they have been earned, and any claim of having paid advance wages constitutes no defense in any action for recovery of full wages.

All stipulations made by a seaman before beginning the voyage for the allotment of any part of his wages during his absence, must be inserted in the agreement and must state the amounts and times of the payment as well as the persons to whom they are to be made. These provisions also apply to seamen engaged in United States ports for foreign vessels. Under the 1915 act, (sec. 10), no American seaman is allowed to stipulate allotments of wages to an "original creditor" for any debt for board or clothing contracted prior to his engagement.

Penalty for Desertion

Desertion is punished by United States laws (Rev. Stat. 4596, amended by sec. 19, act of December 21, 1898, and sec. 7, act of March 4, 1915), as follows: Whenever any lawfully-engaged seaman or apprentice deserts his ship he forfeits all or any part of the clothes or effects he leaves on board, and all or any part of the wages or emoluments that he has earned.

Navigation Authorities

Administration of Navigation Laws: This is largely centered in two Department of Commerce bureaus. These are the Bureau of Navigation and the Steamboat Inspection Service.

Of the latter's functions details have already been given. The powers and duties of the Commissioner of Navigation cover the general superintendence of the United States merchant marine and merchant seamen so far as these are not subject to any other Government officer. He decides on all questions relating to registry, enrollments and licenses of vessels, and the filing and preserving of these documents. He supervises laws concerning admeasurement of vessels and similar matters, has power of interpretation of tonnage tax collections and other questions, and prepares annually full data dealing with the American merchant marine.

CHAPTER XXVI

Marine Insurance

NO WORK on the American merchant marine would be complete unless it showed the bearing upon American interests of insurance against the perils of the sea.

Marine insurance is fundamentally like other forms of insurance; its function is to distribute losses and thus enable men to undertake large ventures in safety. When the commerce of the world began to assume large proportions, marine insurance developed contemporaneously with bills of exchange.

The practice of merchants in the olden time, when they accompanied their wares in the ship, was to contribute proportionately to any jettison of cargo made necessary in the interest of all to save the ship and its ventures. This is the basis of what is known as General Average in insurance practice today. It is not, strictly speaking, insurance. Insurance is accomplished by the method of underwriting risks for a premium, the underwriter being limited in the amount he will take, sometimes by the law and always by his personal judgment of the value of the risk. Marine insurance is a contract of indemnity—the underwriters undertaking to make good to the assured specified losses. Premiums cannot be fixed and they often vary greatly though they tend in normal times to fluctuate within narrow limits.

Naturally the rate of premium depends upon the character of the risk—the nature of the vessel insured, the character of the cargo, the reputation of the master and the operating

company, the destination of the ship and the length of voyage and, very particularly, upon the season of the year and the weather to be expected.

Successful marine underwriting thus depends almost entirely upon the skill and experience of the underwriter. *Lloyd's List*, published in London, gives to its subscribers the most comprehensive, minute and timely information about all listed vessels and the ports they may visit, with reports about tides, harbors, lighthouses, weather and trade conditions. The body of underwriters located at London known as Lloyd's, from the coffee house of Edward Lloyd where underwriters first assembled, is the most influential body of underwriters in the world, as Great Britain has led in marine underwriting. It has been estimated that Great Britain covers two-thirds of all the marine insurance of the world.

Marine Versus Other Kinds of Insurance

Although as has been said, all forms of insurance are fundamentally alike, yet marine insurance differs radically from its commercial twin, fire insurance. Fire insurance rates can be and have been standardized and are based upon actuarial calculations. There can be little exact work for the actuary in marine insurance, for the sea is "various and mutable" and marine insurance proper deals only with perils peculiar to the sea,—“they are of the seas, men of war, fire, enemies, pirates, rovers, thieves, jettisons, letters of mart and countermart, surprisals, takings at sea, arrests, restraints and detajnmments of all kings, princes and people of what nation, condition, or quality whatsoever, barratry of the master and marines, and of all other perils, losses and misfortunes, that have or shall come to the detriment, or damage of the said goods and merchandises, and ship, etc., or any part thereof.”

These words, taken from the centuries old form of marine policy in use in England and with modifications in America and the rest of the world, indicate the peculiar applications of the insurance principle necessary to marine business. It is impossible within the limits of this chapter to discuss the marine insurance policy adequately. This is a very technical document, cumbrous in character and retained in its present form chiefly because through usage and many years of court decisions, its terms have come to be thoroughly and generally understood.

Two classes of professional men owe their importance, if not their existence, to its phrasing,—admiralty lawyers and marine insurance brokers, both of extreme moment to the intelligent conduct of the business. The policy expounds the necessity for and the character of insurable interest, the conditions under which underwriters are liable, the limits of time or space implicated, the character of the property insured—whether hull, cargo, freight or other—and, through its warranties expressed or implied, the good faith required on the part of insured, insurer and carrier.

A discussion of such questions belongs properly to extended treatises on the subject. The man who needs insurance on transportation must, however, know that such insurance exists and should know how it can be made most serviceable to him. As William D. Winter in his book, *Marine Insurance, Its Principles and Practice*, has said, this type of insurance should properly be called Transportation Insurance; for while far the greater part of it applies and will always apply, to the dangers of the sea, marine insurance covers all property being moved from one point to another, never property that is stationary. But there is an apparent exception in that marine insurance is commonly placed upon vessels under con-

struction. About ten per cent. of the marine insurance carried in this country covers inland transportation.

Marine Insurance Essential

The shipments made under conditions of modern commerce are enormous in extent and in value. No shipper of large amounts and no owner of vessels can stand the risk of the total or even partial loss of such huge sums as are involved in the sailing of a large freight or passenger boat today.

Single vessels are worth \$250,000 to \$10,000,000 and their cargoes sometimes more; and while these are sometimes the property of many owners, the amount at risk is too great to permit of the development of modern commerce without the protection given by marine insurance.

The first English statute on marine insurance dates from 1601. It sets forth that there has been a usage "time out of mind" among merchants everywhere when they make any great adventure specially into remote parts to give some consideration of money to other persons, commonly in large number (i. e. underwriters) to have assurance made of their goods, merchandise, ships, etc., at specified rate; so that when there is a loss of any kind "there followeth not the undoing of any man but the loss lighteth rather easily upon many than heavily upon few, and rather upon them that adventure not than upon those that do adventure, whereby all merchants, specially the younger sort, are allured to venture more willingly and more freely."

When, therefore, an individual or a company wishes to secure insurance upon a marine risk, application is made either directly to underwriters or to them through brokers, to assume a part of the risk. Brokers seek to place these risks with various underwriters at the best possible rates, each

underwriter assuming only such part of the risk as his judgment commends and his underwriting capacity makes possible. While there is no limit ordinarily placed upon underwriters as to the amount they can carry, prudence usually dictates the acceptance of a comparatively small part of the total. Where an underwriter assumes more than a prudent share of the risk, he expects to reinsure his excess line and sometimes even more if the risk appears to be extra hazardous. Practice shows that the more widely distributed the risks, and even the line on each risk, the greater the profit both to underwriter and assured. If risks can be (through reinsurance) spread over practically all the insurance markets of the world, the original underwriter stands a minimum chance of disastrous losses; and the prosperity of the underwriter is the prosperity of the assured who can do no business without him.

Winter says (p. 47-48): "In the ordinary commercial transaction there are four documents which collectively are known as a commercial set. These documents represent and take the place of the goods themselves in the financing of the transaction, and pass current in all the markets of the world. These four documents are:—

- "1. The invoice which is the merchant's bill for the goods.
- "2. The bill of lading which is the carrier's receipt for the goods.
- "3. The draft or bill of exchange which is the merchant's payment.
- "4. The insurance certificate which is the document of guarantee."

The insurance policy is therefore an essential part of practically all trading. In the enormous development of the foreign trade of the United States brought about by the World War, marine insurance has played a large part, and the

inadequacy of American Marine Insurance has never been more marked.

Hull, Machinery and Cargo

A report published by the Division of Planning and Statistics of the United States Shipping Board, in February, 1919, contains this account of marine insurance prepared by H. N. Townsend:

"Insurance on hull and machinery of steamers is usually taken out under annual policies and the rates vary according to the following conditions:

- "1. The type and classification of the steamer, horsepower, trading limits, and nature of cargoes likely to be carried.
- "2. The character and experience of the owners.
- "3. Whether the steamers are running in a regular line or are simply 'tramps'.

"Oil-burning and coal-burning steamers, whether with reciprocating or turbine engines, built under special survey in the highest class in Lloyd's register, are considered on the same basis.

"Ships of 4,185 D. W. T. and under are suited only for coastwise and West Indies or South American trade as far as Rio de Janeiro on account of their small size and power. They are not looked upon by underwriters with favor for transatlantic trade, and special rates are only obtainable commercially during the summer months and after meeting special requirements of resurvey, bunkering, etc.

"Wooden steamers, especially oil-burning, carry current rates on both hull and cargo that are very much in excess of those required on steel ships. For wooden ships in transatlantic service, commercial insurance would be very diffi-

cult to secure at any season of the year, and then after special survey, except for risks of total or constructive total loss, general average, salvage charges, and collision liability, which have been quoted at the rate given.

"The rates taken on hull and machinery are regular commercial quotations, and conform to the current American Hull Insurance Association's form of policy as the bases of conditions of insurance, the amount allowed being limited to 40 per cent. of the value in the policies on hull and machinery. In arriving at the cost of insurance the rate taken was determined as the averages. Thus, the insurance on a steamer, where the amount required is, say, \$700,000, can be arranged as follows:

"\$500,000 on hull and machinery, so valued;

"\$200,000 on total loss interests-policy profit of interest, viz, 15 per cent. on disbursements, etc., and 25 per cent. on earnings or profits, etc. and other amounts in like proportion, the valuation on hull and machinery being arrived at by dividing the total insurance required by 140.

"The usual rebate on annual hull and total loss interests are 5 per cent. and 10 per cent.; allowing the usual brokerage of 5 per cent., the net rates, which are given, are $9\frac{1}{2}$ per cent., less than the quoted rate.

"The life of the wooden ship is taken as 15 years, but it is doubtful if insurance at the rates quoted could be obtained during more than the first 5 years. After this period, the conditions of insurance on wooden ships are generally restricted either by reduction in the cost of repairs or by deductible average, of from \$2,500 to \$5,000 on each claim to take care of wear and tear.

"The life of the steel ship is taken as 30 years, but the rates quoted could probably not be obtained after the first

10 years except where such steamers are a part of a regular fleet and the insurance has been in force for a considerable period of time.

"In order to determine the influence of cargo insurance, a general appraisal of the cargo carried is necessary. Insurance on cargo is usually arranged trip by trip and the rates vary considerably according to the conditions of insurance, the size and character of the ship, and its seaworthiness for the trade in which it is engaged. In the case of general merchandise, a valuation of 10 cents per pound is taken. This is probably conservative, in view of the costs of raw materials and labor. The high value of sugar, coal, and nitrate are all taken from normal market quotations during 1918. The insurable value of the cargo carried was determined by adding to the commodity values given the costs of freight, insurance, and a profit of 20 per cent. to the dealer.

"Merchants usually require their shipments insured subject to particular average, which means that if the goods are damaged by perils of the seas, losses can be collected provided the damage amounts to the required percentage under the terms of the policies.

"Under the form of policy issued by the American office, the required percentage is 5 per cent., either in the shipment as a whole or on the various invoices separately, or on a package or an agreed number of packages, according to the contract with the underwriters.

"Some especially hazardous classes of merchandise can only be insured on 'Free of Particular' terms. These Free of Particular clauses are very generally insisted upon by underwriters in the case of wooden steamers and also in the cases of old steel steamers of poor character, the reason therefor being that the chances of damage by sea water are much

greater than if the goods were shipped by first-class modern steel vessels. Therefore the cost of insurance on cargo is not truly relative in the case of the 3,500 D. W. T. wood ship, as equal protection is not given at the prices quoted."

Insurance Markets and Classification Bureaus

London is the greatest of all marine insurance markets. It is the oldest, the most experienced, the freest in operation and most closely bound up with shipping and banking interests. Lloyd's *Register of Shipping* has been the standard for the world. There every seagoing vessel of 100 tons and over is or may be registered and given a classification—based upon its construction, ownership and history—which is accepted without hesitation throughout the world. This classification determines its insurability at a proper rate and, thereby, the insurability of its cargo. It is, in practice, almost impossible to insure cargo in a ship which has no rating or to insure the ship itself. A very few vessels are not rated.

The association of underwriters known as the British Lloyd's is open to all the world, and it eagerly seeks business throughout the world. Without it, in the present state of marine underwriting, there would be no adequate protection to marine ventures. Germany had a growing marine insurance business before the war and that business will doubtless be resumed but with limitations. France, Holland, Italy, the Scandinavian countries, Russia, Japan, China and the British dependencies all have their insurance markets, some of them of growing importance, especially for re-insurance purposes; and these foreign companies have been truly international in their business relations. America alone has remained provincial in its marine insurance dealings.

Lloyd's *Register* is paramount in British underwriting.

The principal registration and classification societies in 1910, and the number of vessels (sailing and steam) classed, were as follows:

	<i>Vessels</i>
Lloyd's Register of British and Foreign Shipping having its headquarters in London	10,302
British Corporation for the Survey and Registry of Shipping in Glasgow	710
Bureau Veritas International Register of Shipping at Paris	4,626
Germanischer Lloyd, at Berlin	2,672
Norske Veritas, at Christiania	1,560
Register Nazionale Italiano, at Genoa	1,263
American Bureau of Shipping at New York	1,139
Veritas Austro Ungarico, at Trieste	1,041
Great Lakes Register (American)	609

It will be seen from this table that the American Bureau of Shipping and the Great Lakes Register combined were insignificant in their totals as compared with the British Registers and the French Veritas. These figures, however, are nearly a decade old and a very material change has come in that period. In 1916 the American Bureau of Shipping was thoroughly reorganized and took over the Great Lakes Register. Since then it has had a greater support from American underwriters, from the United States Navy and from the United States Shipping Board. Few things will be of greater importance in promoting the American Merchant Marine than a well-equipped American classification society which shall be international in its scope.

Today the figures for the chief active registers are:

	<i>Vessels</i>
Lloyd's London	36,926
Bureau Veritas, Paris	8,085
American Bureau of Shipping	2,200

These figures, however, do not give a fair idea of the large and growing volume of classification done by the American Bureau of Shipping. In the case of at least one of the foreign classification bureaus, the number of ships includes many small craft. The American Bureau of Shipping, from 1916 to 1919, classified and put upon its register more than 4,000,000 gross tons of shipping. In that brief period the American Bureau of Shipping rose from a comparatively insignificant position to be the second classification society in the world in importance.

CHAPTER XXVII

Scope of American Marine Insurance

AMERICAN marine insurance is almost entirely confined to the domestic market. There it is preferred to foreign insurance even though the rates are sometimes higher. Its rates are higher because it cannot distribute its risks through reinsurance to the same extent that foreign companies distribute them. When an American underwriter, failing sufficient reinsurance facilities in his own country, places a considerable amount in foreign countries, he may not get credit for premiums paid unless the foreign companies are admitted to do business in New York State no matter how sound they may be. Hence, though his risk is covered, he must keep larger reserves than are necessary, from a business point of view to cover those unrecognized re-insurances.

An unknown but very large amount of business is placed in foreign countries by cable and this is largely untaxed in America. This is prejudicial to American competitors. But in the absence of an adequate marine insurance by American companies, valuable service is performed by foreign companies in placing marine insurance.

The American rates cannot be lowered unless American underwriters can enter the world market and insure British, French or other foreign ships and cargoes on an equal basis, and they cannot do this until they have a large enough business to have something to trade.

There is at present a great need for more American marine insurance even though the amount in existence is enormously greater than before the World War. Many fire insurance

companies now write a large marine business. There is no way of telling how profitable it is because all business is reported together, and there is no possibility of comparing it with the business of purely marine insurance in normal times, since all the business until recently has been complicated with war risks.

Private Companies in America

At hearings in September, 1919, held by the Sub-Committee on Marine Insurance for the purpose of framing marine insurance legislation suitable to America's present and future needs, Representative George W. Edmonds, chairman of the sub-committee, made a report on the results of the questionnaires which he and his colleagues on that Congressional body had sent out to domestic and foreign marine insurance companies operating in the United States. This, however, was a preliminary report and not based upon complete data.

The data thus gathered showed that 128 companies and associations, 88 domestic and 40 foreign, transacted marine insurance in this country.

But of the 88 domestic companies thus far heard from Mr. Edmonds reported that, "12 are not direct-writing companies and receive all their business as reinsurance from other companies; two are direct writing companies but reinsure all their business; one transacts only an insignificant amount of builders' risk insurance; three recently discontinued writing marine insurance; three have been merely organized and have not yet begun the transaction of business; and six confine themselves solely to inland and coastwise waters and transact no ocean marine insurance."

Concerns Exclusively Marine Insurance

"In other words, it appears that there are only 63 direct writing American companies participating in ocean marine insurance, and 69 if both internal and foreign commerce are considered. But of the 63 direct writing American companies, six are controlled by foreign companies through stock ownership or a common management, while at least five more share a very intimate and sympathetic relation to foreign interests by virtue of having directors or leading stockholders resident abroad, or by having a management very closely affiliated with the management of foreign companies operating in this country, together with reinsurance agreements with said foreign companies covering a very large proportion of the total business written. Two additional American companies, newly created and not yet writing business, it should be added, are also foreign controlled.

"Moreover, of all the 88 American companies only 11 confined themselves to marine insurance, and five of these are foreign controlled, or very closely affiliated by management and reinsurance arrangements. Of the uncontrolled companies, approximately one-fifth derived 96 per cent. of their total net premium income from fire insurance and from inland insurance other than marine; one half at least 90 per cent.; two-thirds at least 80 per cent. and three-fourths at least 70 per cent. Excluding the 10 leading companies, all the remaining uncontrolled American companies received approximately only 10 per cent. of their net premium income from marine insurance, while five per cent. was received from motor vehicles, tourist baggage and registered mail insurance, and 85 per cent. from fire and its allied forms of insurance.

Business Sent to Foreign Companies

"From the standpoint of net premium income—the most favorable showing—it would appear that uncontrolled American companies wrote during 1918 somewhat over half of the marine insurance transacted in the United States. But the committee has received estimates from competent underwriters to the effect that at least 20 per cent. of all marine insurance originating in this country is exported directly abroad to be placed through non-admitted underwriters or with the home offices of admitted foreign countries.

"Such exported business does not appear in any of the reported data on this side. When this fact is taken into account, it would appear conservative to conclude that considerably more than one-half of American marine insurance is conducted through foreign channels. Moreover, a considerable amount of marine insurance originating abroad is re-insured in or assigned directly to American companies by foreign underwriters, this amount appearing in the published records of American companies, although not representing American business. . . .

Hull Insurance Discouraged

"Replies to the committee's questionnaire clearly indicate that American companies cater primarily to cargo insurance, and do not, as a general proposition, emphasize hull insurance.

"A number of companies expressed their inability to separate their business into respective propositions for hull and freight, cargo and builders' risk insurance. Thus far, however, 63 American companies have furnished the committee with a detailed classification of their business. Of

these 63 companies four transacted no hull and freight insurance at all, 12 derived less than 10 per cent. of their total marine premium income from hull and freight insurance, 19 less than 15 per cent., 24 less than 20 per cent., 28 (nearly one-half the total number) less than 33 per cent. Almost all of the companies received nearly all of the balance of their marine premium income from cargo insurance business.

"The same situation is also revealed by the reports furnished the committee by the American branch offices of foreign admitted companies. But the committee has been advised by competent underwriters that the practice of exporting marine insurance directly to the foreign market is resorted to particularly in the case of hull insurance. Some of these estimates are to the effect that at least 50 per cent. of all American hull insurance is thus exported.

Must Compete With Untaxed Foreign Concerns

"The unsatisfactory condition surrounding hull insurance is freely confirmed by American companies in their replies to the committee's questionnaire.

"Fifty-one of the 63 companies already referred to, report that they do not emphasize hull insurance. Twelve companies explain that they have found their hull business to be unprofitable; nine state that they do not emphasize hull insurance and write it very sparingly because of the hopeless outlook for this class of business at the time they began writing marine insurance; 14 report that they found only a small profit in hull insurance in pre-war times, while at present the situation is still less hopeful because the enormous increase in the cost of repairs and salving has been accompanied by little or no increase in premiums over those of pre-war years, and 16 state that competition of companies

located in foreign countries, and the facility with which owners and brokers export marine insurance to such countries, preclude any hope of success. Several companies report that they are endeavoring to reduce their hull business, and one important company explains that its hull business, instead of constituting 72 per cent. of its whole business, as in 1918, will be around 25 per cent. in 1919 since it is materially curtailing this class of business on account of competition with the foreign insurance market which escapes all Government and State taxes.

Builders' Risk Insurance

"The situation explained for hull insurance is practically duplicated in the field of builders' risk insurance. . . . But, as in the case of hull insurance, the committee has been advised by competent underwriters that the practice of exporting insurance directly to the foreign market is also resorted to largely in the case of builders' risk insurance.

"As in the case of hull business, American companies freely confirm the unsatisfactory conditions surrounding builders' risk insurance. Eight companies state that the field has been greatly restricted through the operations of the insurance fund of the Emergency Fleet Corporation of the United States Shipping Board; 20 companies report that they do not emphasize such insurance because they see no opportunity of securing any business except at unprofitable rates; nine explain that when they began writing marine insurance they found that builder's risks were almost wholly going to companies located in foreign countries, because, among other reasons, such companies may assume hazards which are forbidden to American companies by the laws of the various States in this country; and nine report that com-

panies in foreign countries, who escape taxes and expenditures which American companies must meet, seem anxious to have the business at rates which they (the American companies) would find unprofitable."

Marine Insurance in New York

New York is the great marine insurance market of America. In 1915 there were 47 American companies and 37 foreign companies writing marine and inland insurance business in New York.

In that year the risks covered were \$21,526,601,714, and the premiums charged upon them were \$101,538,966.35. Risks in force at the close of 1915 were \$1,722,020,767.

In 1918 there were in all, including joint stock fire and marine companies as well as purely marine companies, 94 American companies registered to do business in New York, writing marine and inland insurance for a total, of risks covered, of \$47,046,885,097. The premiums paid amounted to \$181,167,114.12.

Nineteen foreign fire insurance companies and 36 marine insurance companies, 55 companies in all, admitted to New York State covered risks aggregating \$40,884,360,039 on which premiums totalled \$89,108,574.21. But this does not by any means tell the whole story since by far the greater part written by American companies was reinsured in these very foreign companies or in others for which they could get no credit on the New York records. Only the net retained lines of American companies on a statutory basis evidence the American marine insurance facility.

Now that the war is over the business of strict marine underwriting will be resumed uncomplicated by war risks; but the business is bound to expand with the expansion of the

American merchant marine. Federal supervision of insurance, taking the place of the numerous and frequently contradictory state supervisions, and the formulation of a liberal policy to put American companies on as favorable a footing as their foreign rivals, would do much to promote a business which is vital to the prosperity of our merchant marine. A closer co-operation between banks and marine insurance companies, in the English fashion, is also desirable.

American Bureau of Shipping

In reviewing the new shipping legislation reported by the House Marine Committee to the House of Representatives in October, 1919, Chairman William S. Greene of that Committee explained that conditions were in a much more favorable state for the fuller development of American marine insurance. He said:

"An American Bureau of Shipping has been created, which will provide for the classification of shipping after the manner of the British Lloyd's, and with the co-operation of shipowners and American shipping interests this valuable adjunct of the American merchant marine will be materially enhanced. It has too long been the custom to place marine insurance abroad to a considerable extent. In view of this important bureau already established and with the information now being collected and soon to be presented to Congress, there is no doubt that there will be large investments of money made by American marine insurance companies, which will probably be established to meet the great demand for insurance of the world's shipping and especially of American shipping."

To hold a successful merchant marine every maritime nation must have every element controlled by its own people,

which makes toward its success. Dependence upon the facilities of a rival for any of the concomitant functions of a business is obviously a poor policy. Hence a classification society, which is at once the basis of marine insurance and an unbiased appraiser of the quality of ships, is not only an essential but an absolute requisite, if we are to continue to conduct our own maritime affairs.

England has her British Lloyd's, France her Bureau Veritas, Norway her Norske Veritas, Italy her Registro Navale Italiano, Germany her Germanische Lloyds. In fact, all the leading maritime nations, recognizing the necessity of this adjunct, have each provided its own classification society, backed by its own Government in every way necessary for its successful maintenance.

Until a few years ago our classification society, the American Bureau of Shipping, was in a somewhat moribund condition, corresponding in that respect to our merchant marine engaged in foreign trade. Small as it was, it had survived for half a century, and had the advantages of being established and in a going condition. Remarkable as has been the rapid expansion of our ship-building facilities, this formerly small classification society has increased in size and efficiency to meet the demands of the time.

Its Functions and Influence

Under new and more virile management the American Bureau of Shipping has increased its force of surveyors from five in 1916 to 185 at present. Its agencies are in every ship-building and ship material manufacturing district in the country. Through its own exclusive surveyors and through the surveyors of other societies with which it has reciprocal relations, it has agencies at every foreign port where American

ships may call. Its board of managers is selected from leading American underwriters, shipbuilders and ship operators. Its technical committees include naval architects and engineers recognized, both at home and abroad, as the leaders in their professions. It is because of its able equipment that the American Bureau of Shipping has, in a short period, been in a position to classify and put upon its register more than 4,000,000 gross tons of shipping. Organizations interested in America's merchant marine urge that to maintain this organization in its rightful place commensurate with the importance of America's standing in the world's shipping activities, will require the active support both of the Government and of all patriotic citizens.

Bill for Official Recognition

The United States Government, through its bureaus and agencies having cognizance over maritime affairs, is lending all support possible to the maintenance of this society, recognizing thus its obligations to encourage every function connected with the merchant marine. On December 18, 1919, George W. Edmonds, of the Committee on the Merchant Marine and Fisheries, of the House of Representatives, introduced a bill requiring all Government departments and commissions to recognize the American Bureau of Shipping as their agency, so long as it continues to be maintained as an organization which has no capital stock and pays no dividends, and provided that the Secretary of Commerce and the Chairman of the United States Shipping Board shall each appoint one representative to represent the Government on its executive committee. In his report Mr. Edmonds stated:

"The American Bureau of Shipping has always had a high standing among American shippers. It is supported entirely

by the fees it collects for its services. It is not conducted for profit, and upon its board of managers and in its membership are found the names of the men who are the leading and active spirits in all lines connected with a merchant marine. The value of this association as an aid in building up an American merchant marine is recognized by all, and, as the passage of this bill does not in any way obligate the Government financially, nor does it prevent any shipowner who so desires from using another of the classification societies, it is sincerely hoped the bill will meet with favorable consideration.

"In a recent report of a special committee on classification and rating of vessels composed of members delegated from the Lake Carriers' Association, American Steamship Association, American Institute of Marine Underwriters of the Association of Marine Underwriters of the United States, their first recommendation was:

"First. That for all merchant vessels built or operated under the laws of the United States, all technical questions concerning matters of construction in so far as such matters are regulated by statutes, shall be submitted to the American Bureau of Shipping as the principal adviser to the executive branch of the Government, under which supervision of such matters may rest."

Of the load-line bill, passed by the House of Representatives, Mr. Edmonds thought that it would have a marked beneficial effect on American marine insurance. "In the development of our merchant marine," he said, "marine insurance facilities and resources are factors of the first importance, to take care of the hazard that marks this business. The load-line bill prepared by this committee is a fundamental aid to that end; for our marine insurance companies, those in existence and those which are expected to come into existence, will have a better basis for their risks to rest upon, and there

will at the same time be a benefit to operators in the stabilization of insurance rates. During the war I saw that the premium for insurance of a ship bound for Archangel was \$200,000. Even a slight difference in insurance rates may mean the difference between profit and loss to the ship owner."

CHAPTER XXVIII

The British Merchant Marine

WITHOUT its merchant fleets England could not well exist. They are the veins and arteries through which flow Britain's very life blood. The 46,500,000 (estimated) human beings in the British Isles are normally dependent upon other countries and continents for about 45 per cent. of their food supply. With the exception of coal and to some extent iron, Britain must also import a large part of its raw materials which make its great industrial establishments possible.

About one-third of the world's total sea-going tonnage registers from the United Kingdom, and a force of nearly 300,000 men is enrolled in its shipping and fishing industries. But the British merchant marine does more than supply Britain's material needs. It serves to knit together the entire vast British Empire.

War's Effect on Britain's Marine

The world's gross tonnage of ships of 100 tons and over, in June, 1919, as given in Lloyd's *Register of Shipping*, was 47,897,000 gross tons, of which 16,345,000 gross tons, or about one-third, belonged to the United Kingdom. The British Dominions had 1,863,000 gross tons, bringing the total British steam tonnage in June, 1919, up to 18,208,000 gross tons. Before the World War, in June, 1914, the world's gross steam tonnage (of 100 tons or more) was 45,404,000 of which 18,892,000 gross tons constituted the United King-

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dom's tonnage and 1,632,000 that of the British Dominions. Just before the World War, 41.6 per cent. of the world's tonnage was owned in the United Kingdom.

At the end of the World War the United Kingdom's proportion had fallen to 34.1 per cent. The United Kingdom lost during the war 7,759,090 gross tons, part of which was made up by new construction leaving a difference of 2,547,000 gross tons less in 1919 than in 1914. But as has been pointed out in a previous chapter, Great Britain's total loss, as estimated by the normal increase that would have taken place had there been no war, was much larger, amounting to 5,202,000 tons as figured by Lloyd's *Register of Shipping*.

Although the United States, comparing June, 1919, to June, 1914, made a gain of 7,746,000 tons, Lloyd's advances the belief that Great Britain, notwithstanding its losses, is in a superior position for competition in the foreign trade.

Advantages Claimed

It holds that the geographical position of the United Kingdom is more favorable than that of the United States. It is a generally accepted fact, it says, that for ocean voyages large vessels are more efficient and economical than smaller vessels. Vessels of less than 2,000 tons, it further says, are usually employed in the home trade or for short sea voyages in the foreign trade. Because of its geographical position Britain, Lloyd's declares, can employ a larger number of smaller vessels in the foreign trade than is possible on the part of the United States. In connection with these statements, the Notes on the 1919-1920 edition of Lloyd's *Register of Shipping* give this comparison as applying to June, 1919:

NUMBER OF SEAGOING VESSELS OF 2,000 TONS GROSS AND
UPWARDS OWNED IN THE UNITED KINGDOM AND
UNITED STATES

	2,000 and under 4,000 tons	4,000 and under 8,000 tons	8,000 tons and above
United Kingdom	1,042	1,485	263
United States	1,272	811	90

It is interesting to note the part which British and foreign tonnage take respectively in the commerce of the British Isles. In 1913, which may be called a normal year, the total net tonnage of ships entering and clearing in the foreign and colonial trade of the United Kingdom was 164,809,581 of which 56 per cent. was British ships. In 1914 the total was 140,089,538 net tons, and the percentage of British tonnage was the same. In subsequent years the war caused abnormal conditions; the tonnage of ships entered and cleared steadily diminished while the percentage of British bottoms handling the business increased in a marked degree, being, in 1918, 85 per cent. of the tonnage of ships entered and about 66 per cent. of that of the ships cleared.

Britain's Dependent Needs

The dependence of the United Kingdom for food and raw materials of manufacture upon the outside world is forcibly illustrated by a survey of the official figures of exports and imports for normal years.

For example, in 1913 Great Britain imported food, drink and tobacco to a value of £290,202,323; raw materials and articles mainly manufactured £281,822,444; articles wholly or mainly manufactured and sundries £196,709,972, or out

of total imports of £768,734,739 nearly 38 per cent. were food stuffs, about 36½ per cent. raw materials and the remaining 25½ per cent. finished articles. How did the export figures stand? Of a total of £525,245,289 exports of produce and manufactures of the United Kingdom, articles valued at only £32,587,942 were classified as food, drink and tobacco or a trifle above 6 per cent.; coal exported was valued at £53,659,660, and this and other raw materials at a total of £69,904,992 or less than 14 per cent; while manufactured articles and sundries were valued at £422,752,355 or about 80 per cent. of the total.

Returns issued covering the ship trade operations of the Port of London during the calendar year 1918 show that the total net tonnage of vessels which arrived and departed with cargo and ballast in overseas trade was 14,564,000. This represented a decline from 18,053,000 net tons in 1917. These figures do not include the tonnage of many of the vessels engaged in Government service in connection with the war.

The values of the total imports and exports (excluding coastwise goods) of the United Kingdom and six principal ports during the calendar years 1917 and 1918 were as follows:

	1918	1917	P.C. Inc.
United Kingdom	£1,848,549,481	£1,660,921,885	11.3
London (including Queen- borough)	541,905,302	505,800,525	7.1
Liverpool	683,007,552	596,977,551	14.4
Hull	90,398,722	83,660,761	8.1
Manchester (including Run- corn)	107,082,750	88,605,955	20.9
Southampton	39,715,812	24,319,880	63.3
Glasgow	96,565,348	77,053,626	25.3

These facts justify the claim that but for the services of the British merchant marine, the World War could not have

been brought to a successful end. It is entirely true that without "this fleet behind the fleet", "without her merchant sailors, without her fisher-folk in this war as waged with a cunning and ruthless foe, the life blood of Britain would have inevitably ebbed away drop by drop and a creeping and fatal paralysis overtaken her."

Ancient Development

The Phoenecians made trading voyages to Britain and to Ireland before the Christian Era. Caesar upon his visit to Britain about the middle of the first century found a people who were producers of tin and lead and wool which their little coracles took to the people of the mainland in exchange for their products. When William the Conqueror added Britain to his dominions in Normandy there was a well-developed commerce, the exports of tin, lead, wool and even articles of art and luxury being freely exchanged for the silks, the spices and perfumes, the wines and other luxuries of the Continent and the Far East which found their way north over many a difficult trade route, part land and part sea. The struggles against the incursions of the Vikings and the Danes had already developed a hardy race of mariners.

However, it was the Crusades which gave the first great impetus to English shipping and opened the eyes of the English to the possibilities of foreign trade, while at the same time giving the peoples living on the borders of the Mediterranean an idea of the maritime strength and ability of the English. From this time (about 1200) dates England's first shipping code. In those days the ship's master was bound to consult his sailors and also the merchants on board in regard to wind and weather and to determine, by a majority vote, the advisability of sailing. Among the provisions of the Great

Charter of King John was a stipulation permitting all merchants to have safe conduct and to pass either by land or water without the payment of excessive customs.

Evolution of British Merchant Ships

In the time of Henry III an English fleet of forty galleys achieved a great victory over a French squadron of twice its size and thereafter entered upon a career of piracy which, of course, brought reprisals. Thus early we find the industries of the country suffering from the Englishman's liking for a fight, and until well into the 17th Century we find piracy and privateering inseparably bound up with the more peaceful commerce of the seas. In the early days the merchant ships were also the war ships.

The separation of the merchant navy from the King's Navy is of comparatively modern date. The establishment in the time of Edward III of the staple cities in Brabant and Artois and Flanders increased the commerce across the channel. To the reign of this King may be traced the discovery near Newcastle of coal which centuries later was to play such a tremendous role in the development of transportation.

It was in the reign of this same King that there arose for the first time the claim to the "right of search" upon which England long insisted.

The beginning of the demand for restrictive shipping laws dated from the year 1381 in the reign of Richard II. There were similar laws to those which had much to do with the American Revolution and the War of 1812 between Great Britain and the United States. The theory of these laws was to secure the carrying trade of the country for British ships. With more or less severity they continued in force until 1849

when they were finally repealed except as to the coasting trade. In 1854 the British coasting trade was thrown open to the world. The British shipping trade has never been more prosperous than since the commerce of the Empire was freely opened to all comers.

At an early date England asserted its sovereignty over the English Channel, requiring all ships to acknowledge this by "striking or veiling of the bonnets" as one of the sails was called, or by dipping the flag.

The practice of measuring ships to determine their capacity was made compulsory by a law of Henry V passed in 1422.

Become Ocean Carriers

Toward the end of the 15th century we find English ships for the first time making regular voyages to the Mediterranean, many of them engaged exclusively as carriers.

Prior thereto it had been the custom for ships to go on trading voyages only. The merchant accompanied his goods and bought and sold in the various trade centers visited. Frequently the captain of the ship had a part interest with the merchant. At times the merchant would remain at home, sending a factor, who also might be a partner, to act for him. Those providing the money for the voyage were frequently executors of estates and trustees. Shares in trading voyages were considered an especially suitable investment for trust funds. Up to this time all those interested in the enterprise were obligated to share in the losses as well as in the profits. The medieval objections to interest, "usury" as it was called, made this necessary. An investment where no risk was taken was considered immoral. After a while, though, the idea of limiting the risk developed, and then it

was but a short step to reducing that limit of risk to a small percentage—and thus was arrived at an arrangement similar to our modern idea of interest.

Out of these trading partnerships, too, developed the “joint stock” as it was called, the precursor of our joint stock company—and finally with the same limited liability features now taken by most such companies.

Henry VII was actively interested in trading voyages, furnishing ships and equipment and sharing in the profits. He negotiated reciprocal treaties with other maritime states which made it possible safely to undertake long voyages. His “tall ships” traded with Italy and the Levant, taking out fine and coarse Kerseys and other cloths and bringing back silks, drugs, spices and wines, also sweet oils, cotton, wool and Turkey carpets.

Exploration and Commerce

Immediately after the discovery of America, ships went on trading voyages to the West Indies and other Spanish possessions. John Cabot made his voyages of discovery to the new world for Henry VII in 1497 and 1498. Sebastian Cabot voyaged to America first for Charles V. of Spain, and then for the English under Edward VI. Under Edward VI, the boy King, who had a romantic love for the sea coupled with unusual business foresight, the English merchant marine made great strides. In his reign Sebastian Cabot and others organized the “Merchant Adventurers’ Company”. The purpose was to find a northeast passage to India. On May 20, 1553, this company despatched a great squadron amid fears and rejoicing. But the King was too sick to take part in the celebration which marked their departure. This expedition failed in its main purpose, but it opened up trade be-

tween England and Russia to the dismay and loss of the merchants of the Hanse League who had held theretofore a monopoly of that trade, using overland routes.

The Merchant Adventurers' Company probably was the first English joint stock company. It became very powerful and was for many years an important factor in English overseas commerce.

Merchant Ships Made Distinct

To Henry VIII is attributed the organization of the royal navy on a permanent basis. Before his time the main dependence of the Crown for fighting ships had been placed upon the merchant navy. He recruited a force from the fishermen and developed a fighting ship modelled after the trading ship of the day. The "Greate Barke" and the "Harry Groce à Dieu" were tall ships having seven decks fore and aft, with four masts. The Harry was about 1,000 tons burden. At Henry's death his navy consisted of some 60 vessels of all kinds, averaging under 240 tons each, and manned by some 7,000 sailors and soldiers.

In the Elizabethan period ships of England penetrated to all parts of the world.

The voyages of Hawkins and Drake and their associates opened literally the whole world to English commerce and trained up a body of seamen having great initiative and devoid of fear of man or the elements. Such a body of men could destroy an armada of Spain, or go out to conquer the trade of the world from other nations by military force or mercantile acumen. Piracy was common during this period.

East India Trade

It was during this time that the Indian trade became of such importance that in 1600, to develop it, the original East

India Company was organized. Thus was laid the beginning of England's Indian Empire.

Notwithstanding their enterprise, the ships of the English of this time were inferior to those of their neighbors. The Dutch ships could be operated more easily and with fewer men. The Dutch commercial policy was much broader than that of the English. These facts so aroused the envy of the English that, during the reign of the Stuarts, they waged bitter war against the Dutch. The English ruined the Dutch trade for the time and compelled them to "dip their bonnets" when in the English seas.

The English navigation laws of the period were very drastic—"England for the English and the English against the world" was the motto of Puritan England in the time of Cromwell and of the Cavaliers before and after them.

English seafaring enterprise was shown anew by the voyages of Captain Cook and his discoveries in the South Seas—the Society Islands, New Zealand and Australia. Meanwhile, England was experiencing considerable competition from her American colonies. Then came the American Revolution, after which ensued a period of American supremacy on the sea. Of how Britain later attained the supremacy both in ship building and ship operation, full details are given in previous chapters.

Steam Era and Coaling Stations

Steam navigation made necessary the establishment of coaling stations around the world. England's empire gave her an immense advantage in this respect over all competitors. Without the use of England's coal depots her competitors would be placed at a great disadvantage, and might

even be driven off of some important routes. Even a higher charge for coal than that made to British shipping would be a great handicap. In this respect Britain has pursued an enlightened policy, opening all of her coal stations on even terms to all ships, just as she has opened all of her ports without discrimination to the trade of the world. Recently Great Britain has been giving deep consideration to the policy of establishing fuel oil stations throughout the world.

The great deposits of the best steaming coal owned by Great Britain also have hitherto given to her shipping trade a great stabilizer. As we have seen, her imports largely consist of the raw materials of commerce, and of bulky food products, such as grain. Her exports are, for the most part, articles of manufacture which require much less space in the ship's hold. Her coal, therefore, is an indispensable article of export not only for its use as fuel but because of its value in equalizing tonnage space.

Lloyd's Organizations

A review of British shipping would be incomplete which did not mention the great Lloyd's organizations—Lloyd's *Register of Shipping* which records the life history of every ship afloat, British or foreign, and "Lloyd's", the great marine insurance and shipping news organization whose history dates back to Lloyd's Coffee House, the favorite resort of sea-captains and merchants in the latter part of the seventeenth century. In practically every port in the world of any consequence "Lloyd's" has its representatives who are on the alert for any shipping news which they immediately transmit to the "Room" in the Royal Exchange, London, occupied by "Lloyd's" where it is posted for the information of the shipping world.

Then there is the Baltic, the great London Center for whole cargo negotiations. This great organization also had its origin in an humble coffee house. The Baltic has some 2500 members—shipowners, shipbrokers, grain merchants, oil, coal and lumber merchants; wharfingers and tug-owners, buyers and sellers. Here cargoes and ships are brought together, not in English ports alone, but all over the world.

Current Problems

There are certain problems which the English shipping industry must face. The mercantile classes are protesting against the revival of shipping pools which in the past have often actually given the advantage in the matter of rates to the foreign shipper, in order to meet competitors in foreign ports, while maintaining high rates to the home shipper. These pools before the war were all-powerful and to a large extent afforded an artificial protection to those joining in them.

Another move in the line of progress is to develop the harbors of the Empire upon some uniform basis. Instead of hap-hazard methods of the past it is urged that ship construction and harbor development should proceed co-ordinately. The advocates of this measure point out that the life of the empire depends upon its sea communications. Cheap sea communication is vital. It is claimed that if these routes have cheaper freights and better facilities trade will naturally flow through them rather than to and from other countries.

CHAPTER XXIX

Tonnage Definitions

ORDINARILY in discussing shipping three different kinds of tonnage terms are used. They are deadweight tonnage, gross tonnage and net tonnage. Actually, however, there are five different kinds of tonnage. The other two kinds are displacement tonnage and cargo tonnage.

Deadweight Tonnage

Deadweight tonnage signifies the maximum weight of cargo, bunkers, consumable stores and all weight including passengers and crew that a vessel carries when loaded to its deep-load line. Deadweight tonnage is a term used interchangeably with deadweight carrying capacity, and is expressed in terms of either the long ton of 2,240 pounds or the metric ton of 2,204.6 pounds. Deadweight tonnage forms the customary basis for charter rates on ocean going vessels engaged on time charters. It is of special application to cargo vessels carrying coal, iron or other bulky commodities, enabling the ship's operator to know the maximum weight of cargo that the vessel can carry and thus determine the extent of loading.

Gross Tonnage

Gross tonnage is the term commonly used in relation to merchant vessels, and applies to vessels, not cargo. The official merchant marine statistics of the United States, Great Britain and some other countries are published in terms of

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gross tonnage, and in certain countries gross tonnage is used as the basis for the fixing of ship subsidy payments. The term gross tonnage is held in official reports to express in units of 100 cubic feet the entire cubical capacity of the vessel, including the spaces occupied by cabins, engines, boilers and coal bunkers. In the chapter on Measurement and Tonnage Laws in this book there are itemized nine different spaces exempt under United States rules from gross tonnage measurement.

Net Tonnage

Net tonnage construes the net ton as equalling 100 cubic feet of carrying capacity, exclusive of deductions for space occupied by cabins, machinery, fuel, etc. It is therefore a vessel's gross tonnage minus certain deductions permitted by law, and taken broadly signifies the amount of space available for actual carrying capacity of cargo and passengers. Throughout the world net-register tonnage has been the basis for tonnage taxes and other tonnage dues. Towage, dockage and wharfage charges are often based on net register-tonnage. The United States Custom House statistics of ship entrances and clearances and those of many other governments are reported in terms of net-register tonnage. Canal tolls are widely based in part or wholly on net tonnage.

The estimating of these different kinds of tonnages varies according to the type of ship. There is no arbitrary standard of measurement. To compute, for a one-type freighter, deadweight tonnage from gross tonnage multiply gross tonnage by 1.6 which gives the deadweight tonnage. To compute gross tonnage from deadweight tonnage divide the deadweight tonnage by 1.6. No precise rule can be given for passenger and cargo carrying ships in general.

In the computation of net tonnage from gross tonnage, rules and usages vary. Under the Suez Canal rules the average deduction made from gross tonnage in determining net tonnage has been about 28 or 29 per cent. Under the national measurement rules of Great Britain, which have differed from the Suez, the deduction has been about 39 per cent. and the same percentage under those of Germany. Norway has allowed 37 per cent., Denmark 41 per cent., and France 42 per cent. deduction. For the first year or so of Panama Canal operation the deduction was 30 per cent., while in the United States itself, where another official rule prevailed, the deduction was about 34 per cent. On October 1, 1919, the House of Representatives passed a bill directing that in Panama Canal tolls rules of measurement based on actual earning capacity of a vessel govern instead of net tonnage. The proposed rules evidently will cover deck cargoes as well as other cargoes.

Among the different nations of the world reporting on their merchant marine there is no uniformity in terms of tonnage. Some nations give statistics of gross tons, others report in net tons. This diversity tends to confuse comparative statistics. Shipping men believe that to insure better understanding and accuracy in the world's returns of tonnage, an international standard is advisable.

Displacement Tonnage

Displacement tonnage signifies the weight of a vessel, in tons of 2,240 pounds, and is equal to the weight of water displaced by the ship. The displacement "light" of a merchant vessel usually means its weight with that of its crew and supplies but before any fuel, stores, cargo or passengers have been taken aboard. Displacement "loaded" is the

weight of the vessel including cargo, fuel and stores, and when fully loaded to its maximum deep-load line. "Actual" displacement is the vessel's weight when loaded to any given draft. The term displacement tonnage is familiar because of its customary application to war vessels.

Cargo Tonnage

Cargo tonnage means the various forms of cargo tons and tonnage expressing the quantity of cargo and cargo capacity on an ocean-going vessel. Cargo tonnage may be recorded either in weight or measurement tons. A weight ton in the United States and in British countries is the English long or gross ton of 2,240 pounds. Countries having the metric system adhere to a weight ton of 2,204.6 pounds. Although the short ton of 2,000 tons is commonly used on railroad freight shipments in the United States, the long ton is usually the kind used in American overseas trade where goods are shipped as weight cargo. A large amount of ocean freight, however, is shipped not by weight but in units of measurement tons. A measurement ton is usually 40 cubic feet. "Measurement cargo" means light package freight the quantity of which is computed in measurement tons.

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DOCUMENTED TONNAGE OF THE U. S. MERCHANT MARINE, 1789-1919
(By Ten-Year Periods Generally)

Year Ended	Foreign Trade	Coasting Trade	Whale Fisheries	Cod and Mackerel Fisheries	Total
	Tons	Tons	Tons	Tons	Tons
Dec. 31, 1789	123,893	68,807	.....	9,062	201,562
1790	346,254	103,775	.....	28,348	478,377
1800	667,107	272,492	3,466	29,427	972,492
1810	981,019	405,347	3,589	34,828	1,424,783
1820	583,657	588,025	36,445	72,040	1,280,167
1830	537,563	516,979	39,705	97,529	1,191,776
Sept. 30, 1840	762,838	1,176,694	136,927	104,305	2,180,764
June 30, 1850	1,439,694	1,797,825	146,017	151,918	3,535,454
1860	2,379,396	2,644,867	166,841	162,764	5,353,868
1870	1,448,846	2,638,247	67,954	91,460	4,246,507
1880	1,314,402	2,637,686	38,408	77,538	4,068,034
1890	928,062	3,409,435	18,633	68,367	4,424,497
1900	816,795	4,286,516	9,899	51,629	5,164,839
1910	782,517	6,668,966	9,308	47,291	7,508,082
1914	1,066,288	6,818,363	9,864	34,173	7,928,688
1915	1,862,714	6,486,384	8,829	31,502	8,389,429
1916	2,185,008	6,244,550	6,707	33,384	8,469,649
1917	2,440,776	6,392,583	5,623	32,055	8,871,037
1918	3,599,213	6,282,474	4,493	38,338	9,924,518
1919	6,665,376	6,201,426	4,350	36,148	12,907,300

STATEMENT OF AMERICAN DOCUMENTED SEA-GOING MERCHANT VESSELS OF 1,000 GROSS TONS AND OVER, BEFORE, DURING, AND AFTER THE WORLD WAR TO OCT. 1, 1919

Source of tonnage in lists	Sailing vessels and schooner barges						Steam and gas vessels						Total	
	Wood			Steel			Wood			Steel			No.	Gross
	No.	Gross	No.	No.	Gross	No.	No.	Gross	No.	No.	Gross	No.		
Documented to June 30, 1914 . . .	148	230,394	60	115,415	18	24,363	364	1,304,667	590	1,674,839				
Admitted since June 30, 1914--														
From British flag . . .			11	20,857			58	246,103	69	266,960				
From German flag . . .							25	130,665	25	130,665				
From Japanese flag . . .							16	89,772	16	89,772				
From Austrian flag . . .							14	56,930	14	56,930				
From Dutch flag . . .							6	26,577	6	26,577				
From Cuban flag . . .							7	21,173	7	21,173				
From Danish flag . . .							3	10,805	3	10,805				
From Chilean flag . . .			4	5,832			1	4,881	4	10,713				
From Norwegian flag . . .							2	8,188	2	8,188				
From French flag . . .							2	6,595	2	6,595				
From all other flags <i>a</i> . . .			3	4,484			9	25,724	12	30,208				
Repaired foreign wrecks, act Feb. 24, 1915	1	1,302	5	7,426				2,852	7	11,580				
Seized German vessels . . .	1	1,467	6	14,328			44	232,008	51	247,803				
Built and documented June 30, 1915 ^b							12	62,222	12	62,222				
Built and documented June 30, 1916 ^b	6	9,495					34	170,667	42	183,235				
Built and documented June 30, 1917 ^b	13	18,536	2	3,752	16	23,238	61	317,436	92	362,902				
Built and documented June 30, 1918 ^b	31	43,175	3	4,735	43	83,170	190	853,083	267	984,163				
Built and documented June 30, 1919 ^b	35	51,086	1	1,547	210	556,659	587	2,526,574	833	3,135,866				
Built and documented Sept. 30, 1919 ^c	16	22,893	1	2,111	71	186,318	102	954,527	280	1,105,849				
Total, October 1, 1919 . . .	251	378,348	95	1,80,487	360	876,811	1,628	7,051,449	2,334	8,487,095				

^a Total alien flags, 160 vessels, 658,586 gross tons.

^b Built and documented during this fiscal year and now in list.

^c Built and documented during the three months ended Sept. 30, 1919, and now in list.

COMPARISON OF TONNAGE OF AMERICAN VESSELS OF
1,000 GROSS AND OVER 1914-1919

	Sailing vessels and schooner barges						Steam and gas vessels						Total	
	Wood			Steel			Wood			Steel				
	Gross		No.	Gross		No.	Gross		No.	Gross		No.		
	No.			No.			No.			No.			No.	Gross
June 30, 1914	242	387,485	76	14,018	8	10,595	439	1,589,733	755	2,128,731				
June 30, 1916	217	343,513	98	179,691	13	17,799	601	2,354,557	929	2,895,560				
June 30, 1917	230	354,693	97	183,593	41	58,895	660	2,696,368	1,028	3,293,459				
June 30, 1918	216	327,577	99	190,639	91	161,425	874	3,627,251	1,280	4,306,892				
July 31, 1918	224	343,614	94	178,713	95	167,410	922	3,837,886	1,335	4,527,623				
Aug. 31, 1918	224	342,946	94	178,713	108	200,844	953	3,932,473	1,379	4,654,976				
Sept. 30, 1918	222	337,775	93	175,425	138	276,856	993	4,083,759	1,446	4,873,866				
Oct. 31, 1918	226	343,971	93	175,425	170	361,144	1,031	4,252,877	1,520	5,133,417				
Nov. 30, 1918	223	338,947	93	175,425	186	406,759	1,078	4,426,504	1,580	5,341,635				
Dec. 31, 1918	224	341,109	95	177,083	208	464,808	1,136	4,673,856	1,663	5,656,356				
Jan. 31, 1919	225	340,766	96	180,350	211	472,313	1,151	4,770,817	1,683	5,764,246				
Feb. 28, 1919	219	332,955	93	176,829	229	519,767	1,186	4,956,251	1,727	5,984,905				
Mar. 31, 1919	221	334,403	93	176,829	233	531,506	1,227	5,151,827	1,774	6,194,562				
Apr. 30, 1919	226	342,531	94	177,070	248	573,720	1,265	5,307,030	1,833	6,401,251				
May 31, 1919	229	346,819	95	179,542	262	610,440	1,356	5,692,443	1,942	6,829,244				
June 30, 1919	234	354,038	95	179,542	293	693,541	1,436	6,072,901	2,058	7,300,022				
July 31, 1919	238	360,277	95	179,542	320	769,333	1,498	6,396,239	2,151	7,795,391				
Aug. 31, 1919	245	371,090	95	180,487	347	840,611	1,558	6,707,820	2,245	8,100,008				
Sept. 30, 1919	251	378,348	95	180,487	360	876,811	1,628	7,051,440	2,334	8,487,095				

FOREIGN CARRYING TRADE OF THE UNITED STATES 1821-1919
(By Ten-Year Periods Generally)

Fiscal Year	Imports			Exports*		
	In Cars and Other Land Vehicles†	In American Vessels	In Foreign Vessels	In Cars and Other Land Vehicles†	In American Vessels	In Foreign Vessels
1821	.....	\$58,025,890	\$4,559,825	.....	\$55,175,572	\$0,798,410
1830	.....	66,035,739	4,481,181	.....	63,882,719	9,966,789
1840	.....	92,802,352	14,339,167	.....	105,622,257	26,463,689
1850	.....	139,657,043	38,481,275	.....	99,615,041	52,283,679
1860	.....	228,164,855	134,001,399	.....	279,082,902	121,039,394
1870	.....	153,237,077	309,140,510	.....	199,732,324	320,786,078
1880	\$15,142,465	149,317,368	503,494,913	\$5,838,028	109,029,299	720,770,521
1890	40,621,361	124,948,948	623,740,100	32,949,902	77,592,138	747,376,644
1900	44,412,509	104,304,940	701,223,735	110,483,141	90,779,252	1,193,220,689
1910	90,408,369	147,100,976	1,319,438,085	228,724,159	113,736,171	1,402,524,390
1913	115,346,125	193,094,242	1,564,567,867	390,485,334	187,938,253	1,887,460,562
1914	156,217,004	198,923,666	1,538,784,987	316,819,289	169,436,090	1,878,323,769
1915	147,900,328	281,334,841	1,244,934,571	302,233,277	290,597,071	2,175,755,992
1916	197,908,390	449,872,543	1,550,102,577	507,416,794	499,035,673	3,327,030,418
1917	304,616,383	648,256,478	1,706,482,324	825,299,063	803,859,990	4,660,926,341
1918	385,228,158	710,777,017	1,849,650,228	776,438,160	971,718,929	4,165,554,282
1919	478,684,231	875,605,557	1,741,586,794	889,723,806	1,617,234,923	4,718,125,528

*Stated in mixed gold and currency values from 1862 to 1879 inclusive.

† Not stated separately prior to July 1, 1870.

VESSELS BUILT IN THE UNITED STATES AND DOCUMENTED
(By Ten Year Periods Generally)

Year Ended	Sailing Vessels		Steam Vessels		Canal Boats		Barges		Grand Total	
	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons
Dec. 31, 1800	995	106,261	.....	.....	.....	.....	.....	.....	995	106,261
1810	.....	.....	.....	.....	.....	.....	.....	.....	.....	127,575
1820	535	47,784	22	3,610	.....	.....	.....	.....	557	51,394
1830	600	51,491	48	7,069	.....	.....	.....	.....	648	58,560
Sept. 30, 1840	808	106,518	87	14,685	.....	.....	.....	.....	895	121,203
June 30, 1850	1,225	227,997	197	51,258	.....	.....	.....	.....	1,422	279,255
1855	1,781	519,690	246	72,760	.....	.....	.....	.....	2,027	593,450
1860	807	145,427	264	69,370	.....	.....	.....	.....	1,071	214,797
1865	1,377	238,109	411	145,696	.....	.....	.....	.....	1,788	383,805
1870	816	146,340	290	70,621	330	30,256	162	29,736	1,618	276,953
1880	460	59,037	348	78,853	17	1,187	77	17,612	902	157,409
1890	505	102,873	410	159,045	40	4,346	96	27,858	1,051	294,122
1900	504	116,416	422	203,528	38	4,492	483	70,310	1,447	393,790
1910	127	19,358	936	257,993	50	5,720	248	58,997	1,361	342,068
1914	51	13,749	778	224,225	25	2,558	297	75,718	1,151	316,250
1915	51	8,021	751	154,990	40	4,457	315	57,654	1,157	225,122
1916	34	14,765	624	250,135	21	2,551	258	57,972	937	325,413
1917	64	43,185	801	513,243	26	3,423	406	104,628	1,297	664,479
1918	115	83,629	929	1,090,996	32	4,101	452	122,142	1,528	1,390,868
1919	84	79,223	1,524	3,157,091	15	2,731	330	87,505	1,953	3,356,621

Note to the foregoing figures: Statistics of sailing vessels prior to 1868 include canal boats and barges. Those of steam vessels include gasoline vessels since 1897.

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